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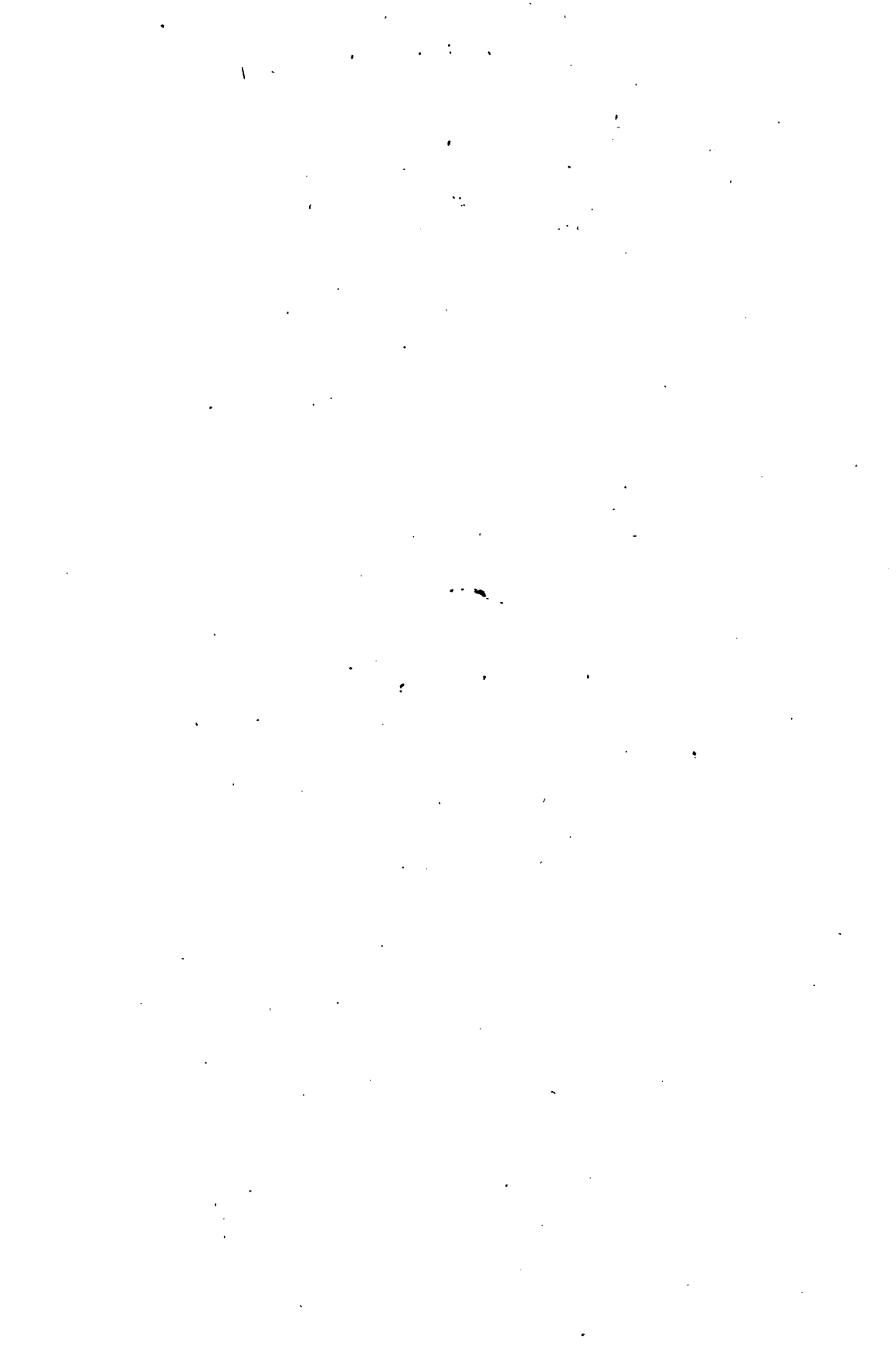
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ARCHIVES
OF
OTOLOGY

EDITED IN ENGLISH AND GERMAN

BY

DR. H. KNAPP
OF NEW YORK

DR. O. KÖRNER
OF ROSTOCK

DR. A. HARTMANN AND DR. U. PRITCHARD
OF BERLIN OF LONDON

VOLUME XXV

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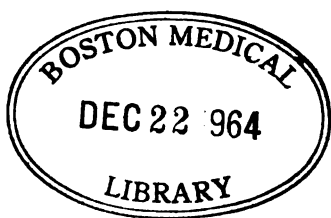
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ARCHIVES OF OTOTOLOGY.

A CASE OF CAROTID ARTERY HEMORRHAGE WITH MIDDLE-EAR NECROSIS; OPERATIONS.

By ROBERT ABBE, M.D.

On October 12, 1895, a child two and a half years old was brought to my service in the Post-Graduate Babies' Wards for treatment of purulent otitis of the left ear, existing for one year.

It was not a sequel of any sickness known to the parents. The discharge was offensive, the child in poor condition. The ear

EDITORIAL NOTICE

The editor regrets the delay in the appearance of this and previous numbers of the ARCHIVES. He has made arrangements to avoid this in the future.

blood.

On the following day the child was in fair condition for operation.

There was an old scar behind the ear leading to the mastoid.

My belief was that mastoid or temporal necrosis had eroded the lateral sinus.

I found the mastoid healthy. I exposed the wall of the lateral sinus and, by extending the trephine opening, the floor of the middle fossa also. No evidence of disease appeared. I passed a



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It was not a sequel of any sickness known to the parents. The discharge was offensive, the child in poor condition. The ear was syringed with boracic acid solution, and iodoform emulsion dropped in for a few days until some improvement of its health might be obtained.

Its temperature was 100° F. at first but became normal in two days.

On the third day, at two o'clock in the afternoon, while the child was quiet in its bed, the ward nurse who happened to be near noticed that the child's pillow and dress were suddenly saturated with blood down to its knees—and that blood was pouring from its ear. She immediately plugged the latter with her finger and sent for the house surgeon who replaced the finger pressure by an iodoform plug. The blood welled up from the ear as quickly as the finger was withdrawn.

I saw the child two hours later. He was extremely blanched, and it was estimated he might have lost six or eight ounces of blood.

On the following day the child was in fair condition for operation.

There was an old scar behind the ear leading to the mastoid.

My belief was that mastoid or temporal necrosis had eroded the lateral sinus.

I found the mastoid healthy. I exposed the wall of the lateral sinus and, by extending the trephine opening, the floor of the middle fossa also. No evidence of disease appeared. I passed a

probe along the petrous portion toward its apex but there was no necrosis there.

Removing the plug I found the bleeding had stopped, and exploring the canal for necrosis the probe touched bare bone in the tympanic cavity and immediately loosened a flood of blood which at the moment seemed dark as if from the sinus. A plug of gauze again stopped it and the child was put to bed to await developments.

There was no swelling over the jugular at this time.

Two days later the temperature rose suddenly to $104\frac{1}{2}^{\circ}$ preceded by convulsive twitchings of the right half of the body. Both eyes rolled to the left and upward.

The temperature fell quickly to $102\frac{1}{2}^{\circ}$ and the patient had a quiet night. Food was retained; there was no vomiting and no loss of consciousness.

October 19th. Four and a half days after the hemorrhage I again ventured to operate, intending to shut off the jugular and mastoid, thus preventing a recurrence of venous hemorrhage and carrying out Ballance's operation.

I tied the jugular first, after removing several enlarged glands overlying it. I explored the lateral sinus, drawing blood by a sterile hypodermic and finding it fluid.

As it was not thrombosed I cut it across and plugged it with iodoform gauze. Feeling secure, I now removed the plug from the meatus and no blood flowed. I left this plug out to give exit for possible pus.

The child rallied well and lived thirty-six hours. No bleeding occurred but he succumbed to exhaustion.

A careful examination by Prof. E. K. Dunham, of the blood drawn from the sinus showed it to be sterile to cultures and normal on microscopical examination.

A careful *autopsy* revealed the following conditions:

Adhesion of the dura over a large abscess of the cortical portion of the posterior occipito-parietal convolutions.

The dura and brain about the temporal bone normal. No evidence of necrosis appeared within the skull.

The lateral sinus and jugular were plugged with a sound and healthy thrombus between the gauze plug and ligature. The carotid artery was plugged by a septic thrombus which had evidently discharged an embolus to the middle cerebral

artery and resulted in abscess necrosis of cerebral tissue. A very careful section of the temporal bone made by Dr. Theodore Dunham, with microscopical reports by Prof. E. K. Dunham of Bellevue, showed a small loose sequestrum of the middle ear, apparently a part of the cochlea, in contact with an erosion of the bend of the carotid artery about one third of its circumference.

Endarteritis had plugged the artery, but at the time of hemorrhages this must have been only partial.

The destructive process was limited to the tympanic cavity and adjacent walls, but gave no evidence on the floor of the cranial fossa of the underlying mischief.

The scale of sequestrum was not more than a centimeter wide.

PURULENT OTITIS MEDIA; ABSCESS IN THE CEREBELLUM; DEATH; AUTOPSY.

By J. H. WOODWARD, M.D., BURLINGTON, VERMONT,
PROFESSOR OF DISEASES OF THE EYE, EAR, AND THROAT IN THE UNIVERSITY OF VERMONT
OPHTHALMIC SURGEON TO THE MARY FLETCHER AND THE FANNY ALLEN HOSPITALS.

J. D., thirteen years old, was brought to my clinic at the Mary Fletcher Hospital, in May, 1892, for treatment of a purulent discharge from his left ear and a large swelling in the region of the left mastoid. A quantity of pus was evacuated by a Wilde's incision, when, after it was ascertained by elevating the periosteum that a sufficiently large aperture existed in the outer table of the bone for satisfactory drainage, operative interference was discontinued. Within twenty-four hours the patient was moved to his home, and he was cared for afterward by his family physician, who reported to me subsequently that the boy had made a perfect recovery.

In July, 1893, I saw this patient for the second time. The left ear was discharging again. Behind the ear I found a discharging sinus, at the bottom of which I found uncovered and carious bone. An immediate operation was advised, but inasmuch as I was about to leave town for a prolonged absence I suggested that one of my colleagues be called in to perform the operation and take charge of the case. At the same time, the family physician was advised to open up the sinus and disinfect the parts as thoroughly as possible, if the patient's family should reject the more radical measures proposed.

On April 17, 1894, I saw the patient for the third time, when he was again brought to my clinic at the Mary Fletcher Hospital. I was informed at that time that the ear had recovered in the summer of 1893 under the supervision of the family physician who had acted according to my supplementary suggestions, but had not made the radical operation on the mastoid which had been

advised. Until early in April, 1894, the boy had been in good health, and his ear had not discharged. Then he began to suffer from severe pain in the left mastoid region and over the left side of the skull; and the ear had begun to discharge again. For several days, the pain had slowly subsided until when I saw him it had ceased to be a symptom in the case. A profuse dirty-yellow purulent discharge poured from the ear, but there was neither swelling nor tenderness in the mastoid region. The boy was able to walk about and on casual inspection he did not appear to be very sick. He was very anæmic, however, and his skin was slightly jaundiced. He said that he felt well. No disturbances in the motor or the sensory mechanism were found, though looked for. The ear was syringed with peroxide of hydrogen several times daily, and the patient was permitted to roam about the ward at will.

The patient's temperature in the morning of April 18th was $98\frac{1}{2}^{\circ}$. During the forenoon he had a severe chill, and his temperature rose to $103\frac{1}{2}^{\circ}$ in the afternoon. On the 19th his morning temperature was $98\frac{1}{2}^{\circ}$; the evening temperature was $102\frac{1}{2}^{\circ}$. On the 20th, the morning temperature was $98\frac{1}{2}^{\circ}$; the evening temperature was $100\frac{1}{2}^{\circ}$. On the 21st, the morning temperature was 104° , when I operated upon his mastoid. During this period I had seen the patient daily, and had examined him with great care in the hope of discovering something that would indicate the site of the pus that manifestly was present somewhere in his head. But I did not detect one objective symptom referable to his nervous system. The subjective symptoms also were negative. He did not complain of any pain whatever. There was not the slightest evidence of inco-ordination, nor was there any paresis, tremor, or spasm, or any change in sensation anywhere. The boy was not very strong, but his weakness was general and in no sense specialized. Perhaps the mental state of the patient should be referred to. His mind was perfectly clear; he answered questions promptly and correctly. Still, there was a certain pertness and an indefinable peculiarity in his talk that seemed unnatural to others as it did to me. His character was by nature peculiar, and his life as a newsboy may have developed the strangeness that we noticed in his mode of thought and his method of expressing it.

In the forenoon of April 21st, I opened the mastoid cells on the affected side, but did not find pus. I did not trephine the skull.

In the evening of the 21st, the boy complained of very severe pain directly in the middle of his forehead. He suffered intensely from this pain, and a hypodermic injection of morphine was administered. I saw him in the morning of the 22d, and ordered that no more morphine be given. At this visit he still maintained that he was feeling well. His mind was clear. His ear was discharging less. His temperature was 99° . His pulse was irregular in rhythm and in force; otherwise, his condition was apparently unchanged. In the evening, his temperature was $102\frac{1}{2}^{\circ}$, and he had another attack of severe pain in the middle of his forehead, which was not relieved by bromide, although it ceased after the foot of the bed had been elevated. On the 23d, the morning temperature was $99\frac{1}{2}^{\circ}$; the evening temperature was $100\frac{1}{2}^{\circ}$. On the 24th, the morning temperature was $99\frac{1}{2}^{\circ}$.

About 4 P.M., April 24th, I saw him alive for the last time. The ear had ceased to discharge, and there had been no effort of repair in the wound behind the ear. The boy was irritable, and wished me to let him sleep. Nevertheless, he replied rationally to my questions. He was able to sit up in bed without assistance. I could not find any motor or sensory symptoms about him, although I made a careful examination. Also, I made a careful ophthalmoscopic examination at this time, and I found the media clear and the fundus normal in each eye. His pulse was still irregular in force and rhythm, and weaker than at any previous visit. During the evening he had more pain in the middle of his forehead, but it did not trouble him long. He was found dead in his bed about 3 A.M., April 25th.

The autopsy was made by Prof. H. C. Tinkham of the University of Vermont. It was found that a purulent pachymeningitis had invaded an area on the posterior surface of the petrous portion of the left temporal bone near the internal auditory foramen. The bone was carious in that region. It extended beneath the lateral sinus. No blood-clot was found in the sinus. Several small apertures through the wall of the sinus communicated with the purulent focus under the dura mater. Adjacent to the latter, the cortex of the left lateral lobe of the cerebellum was discolored, softened, and necrosed over a small area. The remainder of the cerebellar cortex had a perfectly normal appearance, and no adhesions of the dura or of the pia

mater were present on its surface. Incision into this lobe revealed the fact that *its entire interior had been converted into an abscess cavity*, which contained exceedingly foul-smelling pus. Critical examination showed that the white matter had been entirely destroyed, and that the abscess cavity was enclosed by an envelope of gray matter, the outer aspect of which was normal. The thinnest part of this envelope was not less than one-quarter of an inch in thickness. The remainder of the cerebellum was healthy. The lateral ventricles contained an excess of clear serum. One very small fibrous nodule was discovered in the pia mater about one inch to the left of the longitudinal sinus opposite the extremity of the fissure of Rolando. Otherwise the cerebrum was normal in appearance.

It is perfectly evident that no operative interference could have saved this patient at any time subsequent to April 17th, when he was brought to me for the third time. But the probable duration of an abscess in his cerebellum of sufficient dimensions to destroy the function of an entire lobe is a subject for curious speculation.

ON THE DISTURBANCES OF EQUILIBRIUM IN DISEASES OF THE EAR.

BY DR. STANISLAUS VON STEIN OF ST. PETERSBURG.

Translated, in abridged form, by Dr. J. A. SPALDING, Portland, Me.

ACCORDING to Goltz and Mach Breuer¹ the labyrinth contains a special anatomical apparatus or organs of sense which by reflex action serve to maintain our equilibrium during motion (the canals—dynamic organs of sense), and during rest (utricle and saccule—static organs of sense). Many experiments go to prove the accuracy of this hypothesis, so that in our days it has been elevated into a theory.

Ménière was the first to bring clinical proof that disturbances of equilibrium may be due to diseases of the labyrinth. Since then many observers have utilized deaf-mutes, in whom, depending on ill-defined lesions of the labyrinth, disturbances of equilibrium, with simultaneous inability to move about with closed eyes, as well as the absence of nystagmus on passing galvanic currents obliquely through the head, have been observed. The idea next arose to study these conditions not only in deaf-mutes in whom the local condition had become mostly stationary, but in active diseases of the middle ear, and of the cochlear branch of the VIII. pair, and then from the mutual relations of the symptoms to obtain suggestions for prognosis and therapeutics. Another task will be to discover the differences between the

¹ All accessible literature on the topic can be found in my treatise on the functions of the various portions of the labyrinth, published by Fischer of Jena in 1894.

disturbances of equilibrium due to ear diseases and those dependent on affections of the nervous system. The present paper will discuss such disturbances due to ear diseases as were studied during the past three years, whilst pure cerebral and spinal-cord affections will be excluded for the sake of simplicity.¹

Flourens and Ewald experimented only with birds, Boettcher with animals, and Guye² has pointed out disturbances of co-ordination of the right hand as a result of aural disease.

In continuing these experiments on man I have divided my material into two groups; first, the results of the tests for hearing; and, second, of the muscular energy of the lower and partially of the upper extremities with the eyes open and closed. The second group is subdivided into static and dynamic energy. The static energy was more closely examined in the following positions, with the legs close together, standing on the toes, standing on the right or left leg, and standing on an oblique plane. The dynamic energy was tested by walking forward and backward on a level, jumping forward and backward on the toes with the legs closed, hopping on the right or left leg alone forward or backward, turning on the vertical axis of the body with closed legs to the right or left, and finally turning about on one leg alone.

STATIC MUSCULAR ENERGY.

(1) *Standing with the Legs Approached and with Knees Stiff.*

The lower extremities having been approached until the inner edges of the feet touch each other, the patient is placed on a level floor with the eyes directed straight ahead, as the slightest inclination will often suffice to excite disturbances of equilibrium. Then the eyes are closed,

¹ We have abundant examples of disturbances of equilibrium after irritation of the terminals of the VIII. pair from increased pressure in the labyrinth, as by syringing, inflation, compression of air in the meatus, impaction or cerumen, or by the action of tones, or chemical or thermal irritants. (For literary references, compare Schwartz's text-book, and H. Knapp, "Clinical Analysis of the Inflammatory Affections of the Inner Ear," *Arch. f. Aug. and Ohrh.*, II. 1, p. 268. These ARCHIVES, II. 1, p. 204.

² "On Ménière's Disease," These ARCHIVES, ix., p. 230. The handwriting in this case is depicted during and after the disease.

or they may be lightly bandaged. It is best in the beginning to close the eyes, and not to cover them, because if the latter is done the movements are too marked, and the patients often fall on the floor unless some one is on hand to prevent.

The arms hang by the side, but may be voluntarily raised on losing the equilibrium.

A healthy person will stand for minute after minute with eyes closed or open without swaying noticeably. A few persons with ears diseased act also normally, but the majority exhibit disturbances. With open eyes they stand erect, but the moment the eyes are closed they begin to sway, or to incline the body to one side or the other, and finally, according to the extent of the disease, to lose their equilibrium. These disturbances may be thus arranged :

(a) Direct swaying forward and back till they fall forward or backward.

(b) A frequent diagonal sway, in which case the body generally rests on one foot.

And (c) a conical vibration, if we may so express it, in which the body vibrates like a ninepin with its base upward. This is rare.

(2) *Standing Partly on the Toes and Partly on the Soles of the Feet, with the Legs Close Together.*

In this position the disturbances are more noticeable. A healthy person easily takes and continues the position on the toes with eyes open or shut, occasionally making slight compensatory vertical movements, sinking and rising.

Some ear patients act like the healthy, others act normally with eyes open, but when the eyes are closed an instantaneous trembling and balancing is excited and lasts until the patient falls to his heels. In testing, we can give the patient a certain position and then make him close his eyes, or first close the eyes and ask him to take a given position. In the first way, we get falling forward (very often) or backward (rarely), or diagonal, falling front and right, or left, or backward to right and left respectively.

If, however, the person stands a brief time with eyes closed and legs together, and is then asked to stand on the toes, we see:

(a) He cannot with the greatest exertion lift his heels from the floor. They are apparently glued. But if the eyes are opened the motion is at once accomplished.

(b) Or the heels are lifted from the floor, but the patient sinks back, or bends his body backward, or, in order to avoid a fall, he involuntarily makes one or two steps backward.

(c) Or sometimes he can maintain the toe position for a few seconds, only to fall as above mentioned.

(3) *Standing on One Right or One Left Foot.*

Healthy persons with eyes open or closed can stand on one foot for about half a minute provided that from time to time they balance with their hands, and the other lifted leg, and move a trifle from a fixed spot. This test can be facilitated by resting the raised leg on the opposite foot (best for ladies), or by bending it at the knee and resting it against the side of the other leg. If the raised leg is held free in the air equilibrium is with difficulty maintained.

Experiments on pigeons showed that they could stand for a long time on one leg on the uninjured side. The other leg is always weakened.

Clinical observations show that some ear patients may act differently from healthy people.

In the first series of observations, the patients stood on one leg with the eyes open, and then shut, when these motions were witnessed, in the case of the right leg:

(a) Laterally to the right, or (b) laterally to the left.

(c) Diagonally to the right and forward or back (rarely).

(d) Diagonally to the left and forward or back (rarely).

In standing on the left leg the same movements are seen. But if the patient stands with closed legs and closed eyes, and is asked to lift the left leg, we see, (a) after standing awhile he falls as before mentioned; (b) or the moment he has lifted the right leg he lets it fall again, and repeats this just so long as he tries to stand on one leg alone. He also complains of rapid weariness.

The connection between an ear disease and the various directions of motion may be thus exemplified :

(a) *Disease of Right Ear.*—The patient stands firm on the right leg alone, but falls to the right when trying to stand on the left leg alone.

(b) *Disease of Right Ear.*—Stands firm on left leg alone, but standing on right leg alone falls to the left.

(c) *Disease of Right Ear.*—Falls to left from right leg alone and to the right from left leg alone. Crossed disturbance of co-ordination.

(d) *Disease of Right or Left Ear.*—Falling in opposite direction (rarely).

(e) *Bilateral Disease of the Ear.*—As in the first three.

These clinical facts justify this conclusion : Each labyrinth regulates the static muscular energy of the lower extremities simultaneously on the same and on the opposite side. Take case (a). The healthy portion of a region of the right labyrinth sends normal impulses to the right lower extremity, which simultaneously receives the same impulse through the crossed tracts from the left labyrinth. The right leg stands fixed. Standing on the left leg, the left labyrinth sends normal impulses to the left leg, but the right labyrinth does not. The results of the weakened impulse, or omission of impulse, pulls the patient to the right.

These patients do not generally suffer from vertigo. When asked why they do not maintain any assumed position, they reply that they are impelled by an irresistible force.

(4) *Standing on a Descending Plane, with Closed Legs and Stiff Knees.*

In order to express in fractions the intensity of disturbances of equilibrium in certain directions, I have had constructed a static goniometer or angle-measurer. It consists of two boards, the lower of which, 85 cm long, lies horizontally on the floor, whilst the upper one, 1.4 m long, can be moved about an axis of 50°. This upper board is furnished at one end with a toe supporter, 2 cm in height, and against this the end of the foot is rested in experiments. The board is raised by two strong parallel chains, which run around a roller

and handle, provided with a clapper to prevent slipping. The entire iron structure, 1.86 *m* high, can be smoothly pulled out and in through the grating on the lower board. The right side of the apparatus has a graduated arc for measuring the degrees of ascent of the upper board. The entire breadth of the apparatus is 25 *cm*.

BEHAVIOR OF HEALTHY PEOPLE ON THE GONIOMETER.

The patient stands erect on the upper board, with closed legs, stiff knees, hands hanging down, and the tips of the toes against the supporting board. On rapidly turning the wheel and axle, a healthy person with eyes closed or shut can be lifted into the air on an incline up to a certain amount before he begins to totter, but from that degree onward he inclines more and more to fall forward into space. The maximal angle of inclination averages from 36° to 40°.

In approaching the critical point we must turn the wheel slowly because the patient, in order to maintain his equilibrium with eyes closed or open, stands on his toes, and thus raises the soles of his feet from the board.

In order to avoid any anxiety or danger from a fall, the apparatus may be placed before a wall against which the patient can hold out his hands as he tends to fall. And it is also useful for accuracy to have an assistant at hand of whose presence the tested person will be made aware before his eyes are closed. Farther accuracy is obtained by testing with the eyes both open and closed. Additionally, the heels ought not to be more than 1 or 2 *cm* high, and without inside soles. I have also had constructed an apparatus for strapping on the backs of the tested persons, and thus holding them erect on the goniometer. And as this proved too cumbersome, on account of the many straps, I devised another apparatus. It is a rod 2 *m* in height with a circle above, from which is suspended down the centre of the rod a weight with a fine thread for a perpendicular mark. This is fastened to the body in the manner depicted, and serves to hold it erect, the head being erect also and the eyes directed forward.

Particular attention should be paid to maintenance of the head in its position, as its movements forward or backward have an influence on the early or late manifestation of the various disturbances of equilibrium. The latest models for this attachment are provided with two supports for the head as in a photograph rest.

Inclination posteriorly as well as laterally can be measured on the goniometer; in the first direction by placing the heels against the rest, and laterally by placing the outer edge of either foot against the same. Posterior inclination varies from 26° to 30° , and lateral from 37° to 38° .

In patients with ear diseases I do not lay much stress on one or two degrees of variation from the normal, because my observations are not yet so accurate as to measure such slight variations. I would also mention that Gradenigo has lately made similar observations on the deaf, and that his measurements agree substantially with mine.

HOW NOW DO PATIENTS WITH AURAL DISEASES ACT UPON THE GONIOMETER ?

Here we observe three groups,—the first acting normally with eyes open or closed. These are cases of simple affection of the auditory branch of the eighth pair. The second act normally with eyes open, but show static disturbances with eyes closed. The third exhibit slight static disturbances with eyes open, and emphatic disturbances with eyes closed.

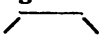
Loss of equilibrium is mostly shown whilst slowly turning the wheel; the patients do not rise evenly, but by starts, forward or backward, and if turning is not at once stopped, the patient falls without having reached his maximum. This shows that the impulse of co-ordination has not reached the muscles with sufficient rapidity, and that the patient at every elevation of the board is put into the same condition as a normal person as he approaches the critical angle. Some patients who fall at their maximal angle when their eyes are closed can still stand if their eyes are open. On closing the eyes again, he can be lifted a trifle higher, or he falls at the slightest elevation.

When I see that a case is a bad one, I do not test so accurately with the body holder, on account of the risk of falling. This may also be obviated by telling the patient at once to open his eyes. Ear patients tire rapidly, and in severe cases the tests should be brief. These patients often behave normally in standing and walking, but exhibit disturbances on the static measurer, which is, therefore, a sensitive demonstrator of co-ordination disturbances. Anæmic people fall at a small angle of inclination.

DYNAMIC MUSCULAR ENERGY.

(1) *Walking Straight Ahead on a Level Floor, Forward or Backward.*

It is easy for a normal person to walk with an even tread on a level floor with eyes open or shut, straight ahead or backward, the steps being equal in length, and the toes pointed outward. They walk faster forward than back. Some from dread of falling stretch out their hands, and shorten their steps. To encourage a rapid walk, the examiner places himself at the opposite end of the room. The walk should be rapid, as disturbances of equilibrium are observed only under certain degrees of rapidity. It is a good plan for the physician and his assistant to walk by the side of the patient to encourage him to do his best, and to assure him of assistance in case of a fall.

The walking test can be varied by making the patient step up over a coffin-shaped plane, like this , upon which a healthy person can walk without stumbling, whilst the affected stumble easily.

OBSERVATIONS MADE IN EAR PATIENTS.

James, in 1882, observed that deaf-mutes spread their legs apart and shuffle as they walk. Teachers in deaf-mute institutes have long observed that the pupils shuffle as they go, rarely lifting the feet from the ground. And Kreidl, in 1884, observed that with closed eyes they could not stand on one leg. Experiments on birds, after lesions of the canals, show weakness in the extremities, and from study of

these we get hints for the possible localization of certain disturbances in man.

The following conditions are seen in aural affections :

- (1) Normal walking eyes open or shut.
- (2) With the eyes closed, going forward or backward, a labyrinthine waddling, caused by protrusion of the legs and shuffling of the feet.
- (3) On walking with eyes shut, a labyrinthine zig-zag to the right and to the left.
- (4) In going forward with eyes shut, a deviation to the right or left ; and finally
- (5) On walking backward with closed eyes, a deviation to right or left.

(In many cases under four and five the patients go round-about to avoid loss of equipoise, one leg making a larger curve than the other.)

(6) Occasionally it is impossible for the patients to move either forward or backward with closed eyes, in their dread of falling.

(2) *Observations whilst Jumping.*

A healthy person can jump to and fro or roundabout with eyes open or shut, varying the distance at will and for several minutes without much exertion. But it is different with the deaf :

- (1) Who can jump with eyes open, but soon tire ; the space covered is not normal and the knees bend excessively.
- (2) When the eyes are closed the jumps are noisier and irregular, the weariness comes on rapidly, and after making two or three long jumps the patient makes short ones.
- (3) The same is observed in jumping backward.
- (4) On jumping forward or back, a deviation to the right or left ; and lastly
- (5) The patient cannot make a jump with closed eyes, but falls to the ground.

(3) *Hopping on One Leg.*

Healthy people can hop two metres, for instance, with eyes open or closed, and straight ahead, the tips of the toes being turned out.

Patients with ear disease act thus :

(1) Like a normal person, but rapidly tiring.

(2) When it occurs that the patient can still stand on one foot, we see one, two, or three long hops, with prolonged pauses, as if the patient were thinking that he ought to make up his mind to hop. Then we see small hops, zig-zag mostly, and occasionally up and down on the same spot. At last weariness becomes extreme and the patient drops into a seat, but not until he has lowered his body by bending the knees toward the floor.

These hops are so characteristic that I call them labyrinthine hops.

During this movement deviation to one side or the other is often noticed, the toes turn inward, the patient balances himself with his outstretched arms, and occasionally sinks so low that his hands touch the floor.

(3) Where the patient cannot stand with closed eyes on one foot, a hop is almost impossible, as the other foot instantly falls to the floor.

On hopping backward similar movements as under (1), (2), and (3) are observed.

(4) *Rotation on the Vertical Axis of the Body to the Right or Left with Legs Close Together.*

This is done easily by the healthy, the person tested raising himself on his toes, and then turns the body on its axis, right or left, several times in succession with eyes open or closed. But if deaf, he either :

(1) Acts normally, or

(2) Makes a complete circle, but all his movements are very slow, and he rapidly tires ; or

(3) He leaves his position and spreads his legs.

(5) *Rotation on One Leg.*

This is the most difficult motion, a normal person learning it easily, a deaf person barely. It is thus performed : The heel is lifted from the floor and the body turned slowly about the leg. Then the heel is again rested on the floor (to save one's balance), then the patient rises on his toes

again, and so on over again till he has completed a circle without leaving the original spot. To many it is easier to turn by hopping on one leg. The movement is made in four directions: for the right leg, to the right and behind, to the left and forward; and for the left leg, to the left and behind, and to the right and forward, all of which can be done by people in health.

Ear patients, with closed eyes, behave:

- (1) Normally, very rarely.
- (2) They cannot rotate at all.
- (3) They rotate with the greatest exertion and move about from spot to spot.
- (4) They jump to and fro or sideways, lose their balance, and then set the other foot on the floor.
- (5) Every attempt to turn or jump ends in a fall. Occasionally they fall in the opposite direction from the attempted rotation, but generally in the same line.

The above suggested disturbances may appear singly or in groups. Those cases in which they occur only in a certain direction are to be regarded as simple, in contradistinction to the complicated cases with several directions of falling. The simple cases offer us purely clinical proof of an exact localization of the peripheral elements. The disturbances of equilibrium can also be combined with aural disturbances of different degrees, so that we get a complicated clinical picture. We may even be compelled to assume in time a complex of symptoms for each branch of the VIII. pair, the cochlear, the saccular, the utricular, and the ampullar.

Still in the absence of exact scientific methods of investigation we must for the present be satisfied with determining the manifold disturbances, and take refuge in a less exact grouping of the still scanty clinical material at our command.

The first group, for the cochlear branch, will contain all cases of lessened hearing without disturbances of equilibrium. The second, for the saccular branch, those with simple or complicated disturbances of varying intensity with simultaneous loss of hearing. I have never seen but one case of

this sort, and they are difficult to determine, because similar disturbances might be due to hysteria, anæmia, or to a central disease.

The third group, the utricular, comprises all cases with loss of hearing and simultaneous disturbances of equilibrium, as seen in most of the cases occurring in practice.

Disturbances of equilibrium are often observed in acute and chronic middle-ear diseases, but rarely in diseases of the outer ear. In labyrinthine disease, they are more permanent. Inflammatory processes of the meatus and middle ear produce but transitory disturbances which disappear with convalescence. Their intensity in middle-ear diseases varies, and they are generally produced by increased labyrinthine pressure, hyperæmia, and inflammation, by all three alone or combined, and the frequency of the same remains still to be determined.

May not all these symptoms be due to ataxia?

Not at all, when we reflect that genuine ataxia is a condition in which a patient who is not paralyzed can no longer perform movements *or can only perform in an ungainly fashion movements which he once could perform with absolute precision.* Nor can the vacillations in standing be due to anæsthesia but to something else and that is weakening, or total loss of tonic impulses for the muscles from the labyrinth. This results in an alteration of muscular action, which is to be divided into coarse and fine. The former are more or less under voluntary control or the control of the eyesight. The latter are observed on closing the eyes, and are, in my opinion, dependent on an automatic apparatus situated in the labyrinth, which from there regulates the finer muscular contractions as in rope-walking, and so on. Perhaps the so-called muscular sense is nothing more than the unconscious sensations which are constantly running from the labyrinth to the muscles.

The disturbances of co-ordination in ear diseases may occur:

- (1) With the eyes closed (in the absence of ataxia and alterations of sensibility).
- (2) With the eyes open, the rapid movements never attain

their normal correctness and promptitude, but are often doubtful and slow.

(3) They may be only observed in certain situations and directions.

(4) They are not always equally divided between the two lower extremities; the patient, for example, can stand on the right leg, but not on the left.

(5) There is polymorphia in the disturbances.

(6) Easy weariness especially with closed eyes.

This may be due to altered muscular energy. The patients have to think, before completing a movement.

(7) A smaller angle of inclination on the goniometer.

(8) With simultaneous diminution of hearing, or another disease of the ear.

(9) Tinnitus or loss of hearing.

(10) With some nasal disease, as adenoids, hypertrophic rhinitis.

(11) Attacks of vertigo (with exclusion of nervous and ocular disease). Visual vertigo differs from aural in that the former disappears on closing the eyes, and the patient walks naturally.

(12) The patient on falling retains his consciousness.

But, after all, we shall often meet with patients in whom the various symptoms are so entangled together, that we cannot precisely localize, and much time may be needed to determine the exact state of affairs.

SUBJECTIVE SENSATIONS.

Most of my patients suffered from disturbances of co-ordination, without a trace of vertigo.

In explaining their sensations they say that they are compelled by an irresistible force to act as they do, whilst others merely lose their idea of space in certain directions, and then involuntarily make compensatory motions to prevent falling.

Parallelism between subjective sensations of sound and loss of equilibrium cannot always be fixed. But often, very loud noises are accompanied with disturbances. Noises

without loss of hearing but with loss of co-ordination indicate a labyrinthine disease. Thus we may diagnosticate:

With loss of hearing by A. C., but good B. C., no disturbances: an affection of the conducting apparatus.

With loss of hearing, good A. C., good B. C., tinnitus, and no disturbance: affection of the conducting apparatus and ramus acusticus.

With loss of hearing for A. C., good B. C., no tinnitus, but disturbances of co-ordination: affection of the conducting apparatus and static-dynamic branches, due to increased labyrinthine pressure, hyperæmia or inflammation. If catheterization improves the hearing, the conducting apparatus is affected.

With loss of hearing for A. C. but preservation of B. C., with tinnitus and disturbances of co-ordination: affection of sound-conducting apparatus.

With A. C. and B. C. good, tinnitus, and co-ordination disturbances: affection of acoustic and static-dynamic branches. With good A. C. and B. C., and disturbances of equilibrium, it is difficult to decide. If disturbances are better after Politzerization, we suspect labyrinthine disease. This diagnosis is more probable, if after instillation of cocaine into meatus, or insufflation of cocainized vapors, the disturbances increase.

LOCALIZATION OF THE DISEASE.

Static disturbances suggest affections of the utricle and saccule; dynamic (with nystagmus), disease of the ampullar system.

The symptoms of labyrinthine disease, such as tinnitus, deafness, vertigo, uncertain steps, nausea, vomiting, and occasional fainting, can combine in many ways; such as tinnitus alone, deafness alone, tinnitus with deafness, vertigo with disturbances of equilibrium, sudden falling to the ground with vertigo, disturbances of equilibrium, Ménière's complex of symptoms, and two new symptoms not hitherto mentioned, namely, tinnitus with disturbances of equilibrium in certain directions with or without loss of hearing, without vertigo or nausea, and finally momentary precipitation to

the ground when the eyes are closed, associated with tinnitus and more or less deafness, but without vertigo, nausea, or loss of sensibility in the skin, or of consciousness.

From a prognostic point of view, the more marked, permanent, or manifold the disturbances of equilibrium in a peripheral disease of the ears, with simultaneous loss of hearing, the less hope there is of any restoration of hearing.

Many deaf people complain of being hurled to one side whilst walking, but without loss or with but the faintest loss of consciousness. Many such attacks are referred to petit mal, or epilepsy. So too where an aural affection has never been diagnosticated, many slight symptoms are referred to incipient ataxia, such as inco-ordination, on arising from a chair, whilst standing on one foot, on suddenly standing still after walking, on going down stairs, but they can all be explained by an affection of the labyrinth.

Theoretically, the otoliths are structures which obey no impulses but that of gravity, and which exercise a constant and uniform irritation upon the terminal branches of the utriculus and sacculus. In inflammatory affections we can imagine that the otolithic plates exercise a much more intense effect upon the irritated organs, or are partially dissolved and float about in the endolymph. If we move rapidly, or come quickly to a stop, the otoliths will not exercise the usual uniform impulse upon the muscles by whose synergic or antergic contractions the co-ordination of movements is produced, so that in time we get a new disease entitled *asynergia musculorum labyrinthica*, with its utricular and saccular subdivisions.

Let me now call brief attention to some typical cases:

CASE I.—Dr. H., aged thirty-three, suffered from scarlatina in youth but without troubling the ears, until when seventeen his left ear failed and continued to grow worse despite treatment. The pharyngeal affection was also treated, and the nasal douche tried. Tinnitus gradually appeared in this ear. The right ear remained good until three years ago, when catarrh ensued, and, not long after, the hearing of both ears became poor. No syphilis, no heredity. Ever since childhood he has felt dizzy on high places.

Examination shows *Mtt* gray and retracted ; improved hearing after the catheter. Right ear : whisper 11 m., Politzer's audiometer 8 m., and A. C. for tones good.

Left ear : violent tinnitus, causing melancholia at times. Whispered voice, at meatus ; audiometer, on contact ; vibrations from 36 to 20,480 Koenig ; Galton, 3.6 ; Weber, left, and Rinne up to 512 ; B. C. good for all tones up to 1024.

Static tests with feet together and eyes open, normal ; with eyes closed, gentle swaying of body to right, then to left, occasionally forwards.

Standing on the toes with eyes open, normal ; with eyes closed, an invincible inclination forwards ; he exerts all his strength to maintain his equilibrium, bending his knees, and his body excessively back, and then standing on the tips of his toes, but, despite it all, he is suddenly hurled forward.

On right foot alone, normal with eyes open ; with eyes closed, he moves diagonally to the right and forward. On left foot, he stands normal with eyes open, but with eyes closed inclines to the left, and after great efforts to maintain his equilibrium, falls backward to the right.

The goniometer shows an anterior inclination of 30° with eyes open, but only 12° with eyes shut ; posterior inclination of 30° eyes open or closed, and lateral inclination of 37° with eyes open, but with eyes closed and the right foot turned to the supporter he falls diagonally to the right at 14° , and straight to the left at an angle of 9° when the left foot is placed next to the supporter.

Dynamic tests : Walking forward, with the eyes open, straight-forward ; with eyes closed the gait is normal but the legs are spread apart. Walking backward is normal with eyes open ; closed, he deviates to the left.

Jumping with both feet is normal with eyes open or closed. Hopping on the right foot is normal with eyes open ; with eyes closed he curves to the left, and on attempting to hop backward he fell forward violently to the floor, and lay there like a lifeless body, but when the bandage was taken from his eyes he lifted himself from the floor. He complained of excessive weariness during the tests. It seemed to him, as he fell, that it resembled a fall in a dream, but there was no vertigo.

The tinnitus was successfully treated with cocain-vapor, and the hearing simultaneously increased, but the co-ordination disturbances at the last account had remained the same.

CASE 2.—Aged nineteen ; previous attacks of rheumatism ; gradually deaf in both ears ; suffers greatly from tinnitus. Contra C fork is perceived as a rumbling, but no other can be heard.

With eyes open the tests are normal, and so too when on both feet with eyes open or closed, but on closing eyes whilst standing on one foot he falls to the left from the right foot, and to the right from the left foot. *This is then a case of crossed disturbances of equilibrium.*

CASE 3.—A lady of twenty-one suffering five years from progressive loss of hearing, despite pilocarpine injections and other remedies. Bone conduction good, but A. C. bad ; high tones perceived. With the eyes open static and dynamic tests are normal, except in standing on the right leg the patient is pulled to the left. On closing the eyes and standing on both feet she falls forward ; standing on the left foot, she falls to the left, and the same from the right foot.

Here we observe with excessive deafness *a slightly marked disturbance in the direction of the worse ear.*

CASE 4 offers nothing of interest except that with loss of hearing in both ears the patient falls in the direction of the worse ear when standing on both legs.

CASE 5 is a man of thirty-two suffering from what appears to be syphilitic deafness, though there are symptoms of ordinary ot. med. cat. chr. in both ears. With eyes open he stands and walks normally, but on closing the eyes he falls generally to the left either from both feet or from either one alone, which is in the direction of the worse ear. After treatment with cocain-resorcin instillations the noise in the right ear increased and the hearing deteriorated. Gradually, however, the hearing in the right ear improved, but repeated tests showed a constant tendency to fall to the right, which was finally *the better ear of the two.*

CASE 6.—A locomotive engineer, of thirty, has gradually lost his hearing in both ears. Syphilis suspected. Constant tinnitus, but *Mtt* normal and tubes open. Hearing in the right ear is : whispered voice at 30 cm, audiometer 56 cm ; forks, with difficulty, Galton 2.5, and Koenig 24,576. Left ear : loud voice on contact ; Galton 3 and Koenig 20,480. Bone conduction for Weber gives a "trembling" sensation, whilst Rinné is positive in the left ear.

The static tests are normal with eyes open, but closed, a slight swinging motion of the whole body. The dynamic tests, on the

contrary, show *slow* walking possible with the eyes open, but when they are closed the patient turns partly about on one foot, and from time to time, when standing on the left leg, the right is let fall to maintain a balance.

CASE 7.—A very intelligent woman began to lose her hearing soon after the birth of her first child, and after each successive childbirth the hearing has invariably decreased. She suffers from tinnitus when tired. She can barely hear a loud voice close to the right ear, not at all with the left. All forks barely perceptible. Galton, 6 in the right and 4 in the left ear. Rinné negative, and Koenig 10,000 right and 8000 left. B. C. good in the right for all tones, but only high tones in the left.

On closing her eyes she falls backward, is obliged to exert great force to rise from the floor, and then falls backward so that she has to be caught. When walking she wavers, now to the left and then to the right. Treatment useless.

CASE 8.—Concussion from a bullet in the right ear in 1877, followed by tinnitus, later by headache and repeated attacks of vertigo, so that oftentimes he had to remain in bed. During an attack everything falls in upon him, but he never has lost consciousness. In 1880 he became deaf in the injured ear. Up to 1891 the symptoms remained the same, but then new symptoms appeared, especially a sort of *shock* in the head, so that the face became pale, the eyes red, and he could with difficulty maintain an upright position. After the influenza in 1892 he was repeatedly affected in this way, momentarily falling to the ground, but without losing his consciousness, and always able to stand again unaided. When forewarned he could momentarily prevent an impending fall by supporting himself against some neighboring object, but ultimately no matter how strongly he resisted he would be hurled to the earth. Occasionally this occurred when sitting in a chair. The tongue was never bitten, no foaming at the mouth, and no convulsions. He simply felt exceedingly tired. Late in September, 1892, he struck his face against a table in one of these attacks. He leads a regular life, neither drinks nor smokes, and has no signs of syphilis.

Treatment of the nervous system useless.

1893.—The right ear cannot distinguish loud voice or whispered voice on contact, nor the audiometer, nor anything by bone conduction. Koenig 16,384, and Rinné negative. The left ear hears loud voice well, low voice at 1 M; audiometer, same dis-

tance ; Galton 2, Koenig 24,576, B. C. good for all tones, and Rinné positive.

With eyes open, the static tests are normal, except a slight wavering on the toe tips. Inclination on the goniometer 22° .

On closing the eyes, he falls forward and to the right from the toe tips, and to the right from either foot alone.

Goniometer 14° with eyes closed.

Dynamic tests : With open eyes he can walk directly forward or backward, or rotate on one or both feet, but when his eyes are closed he turns to the right in walking forward ; can walk straight backward, but on rotating on the right foot, hops to the right, and balances with hands and body, and on rotating to the left deviates farther to the left ; finally, in rotating on the left foot he falls to the right when turning to the right, and to the right in rotating to the left.

Instillation of cocain-resorcin into the right ear twice daily ; result, head aches less, no repetition of the falling to the ground, and the tinnitus was scarcely noticeable. Noticeable increase of hearing in the left ear after catheterism, which before had been of no use. Thus improved, the patient was discharged in November, obliged only from time to time to renew the instillation of cocain-resorcin to prevent the old attacks.

CASE 9.—A lady of thirty came under my care in 1884 with tinnitus and permanent headache, following soon after a silver cauterization of the naso-pharynx. The first symptom was profuse double otorrhœa. This ceased, and the hearing remained intact, but the tinnitus persisted. Many remedies were employed—for instance, arsenic, silver, antipyrin, antifebrin, phenacetin, cocain, blisters, galvanization, faradization, and so on, most relief being obtained from arsenic. The electric light relieved the pressure in the ears and the tinnitus. Pilocarpin caused œdema of the auricles. Saline irrigations of the nasal passages were useless ; catheterization increased the tinnitus. Politzeration was useful at first, but not later. In summer the symptoms were lessened, but of late there has been no change between one season of the year and another. The rhinitis was relieved, but deafness and tinnitus have gradually increased. For the last six years the patient has suffered intensely from headache, and has been obliged to sleep in a reclining position, for the moment she lies at full length, a terrible pain, with tinnitus, is excited, and she feels as if she were being hurled over a precipice. In spite of

this torture she sews fifteen hours a day. During her youth she suffered from somnambulism. She has had occasional otorrhœa during the past ten years.

Present condition : Anæmic, cannot move rapidly, does not stumble, except when moving rapidly, as, for instance, to avoid a carriage approaching, or to step from the sidewalk to the cross-way. After dusk she keeps close alongside the houses, and avoids crossing the streets. She can climb steps easier than go down them, and in the latter act is obliged to hold fast to the banisters.

The upper extremities are normal, handwriting clear, and she sews beautifully.

The mucosa of the nostrils is hyperæsthetic, and the sensibility not deadened by cocain, so that catheterization is difficult. After performing it, the hearing is decreased.

She suffers from tinnitus, which increases on lying down, whilst at the same time the hearing grows worse and severe pain is perceived in the ears. When sitting erect, no nausea or palpitation of the heart, but both on lying down.

Static tests with eyes open ; slight tilting in no particular direction ; with eyes closed, in all the tests a rapid falling to the left mostly, occasionally to the right.

Dynamic tests : She can walk correctly with eyes open, but zig-zag with them closed ; she cannot jump with both feet but falls to the floor like a dead body ; standing on both feet she cannot turn round with her eyes open but stands as if glued to the floor. If she is supported in the least, even by the little finger of her physician, she can turn easily. On closing her eyes, with or without support, she instantaneously begins to totter.

Low voice at from 1 to 3 *m* ; the audiometer from $\frac{1}{2}$ to 4 *m* ; Galton's whistles faint and all forks on the vertex, but not in the ear. Some forks produce a painful sensation by A. C., but generally there is no perception beyond a low, booming, or trembling sound, as she expresses it. Forks corresponding to about the pitch of the tinnitus are more painful than those above or below. Hyperakusis between 640 and Koenig of 8192 ; beyond the latter, none. So, too, Galton of 10,000 vibrations (3.6), is very painful.

Rinné's test is positive in the right ear. There is an occasional secondary resonance.

Static tests a month later with eyes open were normal ; with eyes closed and on both feet together, she falls backward. If she

closes her eyes, but then suddenly opens them and separates her feet, she can remain erect. There is no vertigo, but the same irresistible force as in other patients. *The floor flies out from under her feet.* If she is placed on the floor with her eyes closed she can get no higher than to her knees without support. From the toes she falls backward and to the right, with eyes closed. Open, she can stand still a second, then falls. From one foot, with her eye open, she falls to the right; and with eyes closed, to the right and backward.

Dynamically: she walks forward and back well, but with eyes closed she falls back to the left before taking a step. With her eyes open and both feet together she cannot jump, for the moment that she makes the movement she falls to the left. With the best of intentions she cannot maintain her equilibrium. Neither can she move to make a jump with her eyes closed. On attempting rotation she falls with her eyes open, making a quarter turn, and then falling to the left. With her eyes closed she cannot turn in the slightest degree.

The probable diagnosis is a partial affection of the acoustic branch of the VIII. pair, based on the fact that she cannot maintain the upright position with her eyes closed; moreover, an affection of the saccular branch.

CASE 10.—Miss —, æt. eighteen; loss of hearing in the right ear after typhoid fever, and two years later in the left ear, but has never suffered from tinnitus. Within the last few months she has felt dizzy in the dark, and has been obliged to hold to something to prevent falling. Even as a child, was unable to move rapidly without a sensation of faintness. Has rhinitis hypertrophica. The drumheads are retracted. She barely hears low voice on contact, and deviates to the right in walking with eyes closed.

The patient was treated with instillations of cocain-resorcin, and cauterization of the turbinates with the galvano-cautery.

Hyperakusis for small forks up to 2048, which are then no longer heard. Low forks are painful. Koenig's rods are not perceived in the right ear, which is the worse ear. Left ear hears voice at 4 M and whisper at 1 cm; there is less hyperakusis than in the right, and high forks are slightly painful. Galton's whistle not heard in the right ear.

Audiometer on contact with the right ear, and at 1 M with the left ear.

With eyes open the patient falls forward from the toes, but on closing the eyes, on the right foot she wavers to the left and then back and forth ; on the left foot she stands firm. With eyes closed she stands firm on both feet : cannot stand on her toes ; from either foot alone, falls in the same direction.

Dynamic tests show deviation to the right in walking, and an unavoidable dragging forward from the right foot alone, till finally the left foot falls to the ground for support. All of the rotation tests are imperfect, and accompanied with a sensation of falling.

Treatment of cocain vapor was carried on for some time. A year later some improvement in the hearing in each ear. On closing the right ear a loud roaring was perceived in the left ear. Forks still painful to the right ear. Koenig rods still inaudible in the right ear. The static and dynamic tests remained about the same, except more noticeable inclination to fall on closing the eyes. Walking with eyes open or closed was uncertain. The jumping and hopping tests showed an inclination to fall backwards, and the rotatory tests a tendency to the right (or left) and backward.

CASE 11.—A girl of thirteen became deaf in the right ear after a right-sided parotitis. No vertigo. The toe-tests showed an inclination to fall forward ; the one-leg tests, to fall to the same side ; and the dynamic tests, a deviation to the right.

All efforts to restore the hearing were futile.

CASE 12.—A boy of eleven with double parotitis and loss of hearing in the right ear, with high temperature, and pain in the ear. Repeated attacks of vertigo. On the fifth day I saw the patient with temperature 39° (102° F.) ; drumheads normal. On arising from the bed he had attacks of dizziness. All objects seem to move from the left to the right. He cannot stand steady with both feet together and eyes open. On closing his eyes he falls back to the right. Standing with eyes open on either foot alone, he becomes pale, and falls backward. Phenacetin and instillations of cocaine.

CASE 13.—A lawyer of thirty-two ; progressive loss of hearing, right side, for some years. Three years ago, without apparent cause, sudden loss of hearing in right ear with otorrhœa. No tinnitus, occasional pulsation in right ear ; no vertigo ; pharyngitis and rhinitis hypertrophica. Right meatus is filled with pus. Left drumhead contracted and thickened. Tubes free.

Hearing of right ear : contact for loud voice, low forks not

heard, higher ones up to Galton's whistle well heard. Koenig 20,480. Left ear low voice 8 m, and all tones good.

All the static tests normal with eyes open, but with eyes closed a tendency to the right. Goniometer 35°.

Dynamics : good with eyes open, but with eyes closed imperfect, equilibrium being maintained by balancing with hands and arms in all positions.

CASE 14.—A porter, aged thirty, deaf in left ear for a year ; fell on the ice a year before, bled from the left nostril ; was unconscious ; was treated with ice-bags. On leaving the hospital he could not walk straight, being hurled from one side to the other despite all his efforts. His sight was also imperfect.

His gait has much improved at the present time, a year later, but he still falls against people in the street ; his left leg is weak, he limps on that side, but his handwriting is not affected.

He has long been deaf on his left side after being boxed on the ear. Paresis of the rectus internus of the left eye was diagnosed, and probably has some influence upon the vertigo.

B. C. localized on the right side ; right ear normal ; left drum-head contracted, with a small cicatrix in the lower quadrant. Loud voice not audible, audiometer perceived, forks poorly perceived ; high forks heard well ; hyperakusis.

With eyes open, all tests good ; closed, he falls to the right and forward.

The angle of inclination is almost normal, but he falls forward easily and grasps for support without actually falling.

The dynamic tests, with the eyes open, are normal ; with the eyes closed, he jumps to the right ; on hopping he gives labyrinthine hops, three or four long ones straight ahead, then smaller, and now to the right and then to the left, thinking all the time he is going forward as before.

Rotation tests are a failure.

CASE 15.—Doctor K, age thirty-nine ; deafness of left ear of many years' standing. Drumheads sunken and opaque. Hearing of right ear normal ; left ear, loud voice 1 M, forks between 32 and 1024 faintly. Galton 2, audiometer 4 M. Bone conduction good, but better on right side. With eyes open all the static and dynamic tests except rotation are normal, the latter needing balancing with arms and hands to complete. With the eyes closed, the static tests show swaying mostly to the left in all positions. To avoid falling he leaves his position of rest. The

dynamic tests with eyes closed are nearly normal except rotatory movements which he cannot accomplish without deviation to the left : occasionally to the right from the left foot alone.

A year later diminution of hearing, and increased vertigo, whenever he turned his head rapidly to the left. He was often hurled to one side with a tendency to nausea and vomiting. The vertigo was often accompanied with an invisible blow on the head. Attacks in the past month almost daily. Has never lost consciousness : lying in bed with eyes open or closed he feels as if falling over a precipice. The blow on the head seems to act from the right to the left. He complains of a dead feeling in his feet as if the floor had left him in the air. He stamps with his heels to be sure that he is standing firm. Hearing worse and slight tinnitus. Has abandoned tobacco and liquors, but without improvement.

Hearing of right ear as before. Left ear : low forks not perceived ; high ones well heard. Galton 3, and Koenig 16,384. Low voice on contact. All tests are normal with eyes open, but with eyes closed he wavers to and fro, and in walking deviates to the right or left, going forward to the right, backward to the left, and from the right foot hopping forward to the right, and from the left to the left. Rotation tests defective to the left.

Treatment with cocain instillations into the ear and insufflation of cocain vapor by the catheter twice a week improved his condition so that he could walk more securely, his feet lost their numbness, the vertigo disappeared, and he was able to do work without distress.

CASE 16.—A child of eight years. Soon after vaccination, was attacked with a long illness, either typhus or meningitis, and by all physicians a fatal prognosis was given. The child, however, recovered slowly. Later pneumonia. The child was very slow in walking, and often fell to the floor. Deafness has gradually supervened.

The child is anæmic, but bright. On rapid movements she falls forcibly to the floor, and on darkening the room she can hardly get about. Rhinitis and adenoids ; tubes close. Cocain-resorcin, catheterization and bougies, and removal of the adenoids. The result on the disturbances of co-ordination was absolutely null.

Hearing with right ear : low voice 2 *m* ; loud voice 5 *m* ; high forks heard ; bone conduction best, right. Left ear : low voice 5 *m*, low forks nothing, high forks well heard. No vertigo.

With eyes open static tests normal ; closed, she wavers to the right and forward. From right foot, on closing eye, falls to left ; from left foot, falls to right. On the goniometer the left shoulder bends forward, and the body to the left. On lifting slowly she falls forward and has to be held. Inclination 10° .

The dynamic tests show deviations even with the eyes open. Rotatory motions are imperfect ; some cannot be performed without leaving her position, others she cannot do at all. On closing the eyes there is deviation to the right. Labyrinthine jumping and tendency to the left. Hopping irregular ; on right foot, to the left. On the left foot she hops well, but gradually inclines to the left and backward. Rotation tests with the eyes closed, tendency to fall to the right.

CASE 17.—A workman of twenty-six ; loss of hearing and tinnitus left ear. Vertigo on bending forward. Tinnitus is like hissing or whistling. Right ear normal ; left ear : audiometer o, loud voice not heard, low forks heard fairly well, but no high forks. By B. C. all tones localized on the right side.

Static and dynamic tests with the eyes open, normal ; but with the eyes closed, in the direction of the healthy ear. *In other words, with almost total deafness in one ear, the disturbances of equilibrium are in the direction of the good ear.*

CASE 18.—Aged thirty-one ; tinnitus during mental exertion with loss of hearing (no vertigo) first in one ear and then in the other. No treatment. The tinnitus is of double nature : one pulsating noise, permanent ; a second, hissing noise, occasional.

Hearing very poor in both ears ; high forks well perceived. B. C. good for all tones.

When standing on his toes he inclines forward with great impetus. The angle of inclination is normal. Dynamic tests normal with eyes open or shut.

The case is probably *one of otitis media sclerotica with slight disturbances of equilibrium, probably due to increased labyrinthine pressure caused by stapes ankylosis.*

CASE 19.—Doctor C., æt. fifty ; at the age of thirty-two has a sudden attack of vertigo, with heaviness in head and bent body lasting for several months. This was diagnosticated as anæmia of the brain from overwork. He improved and three years later suffered from attacks of falling, and was afflicted with a dread of falling, which was relieved by large doses of bromide of potash. The right ear gradually failed, and tinnitus has set in for the past

year. The vertiginous attacks have long been constant ; even when sitting at his desk, his head falls forward despite all efforts to the contrary. In January, 1894, he could not make a step, and even abed he felt as if his feet were being raised into the air and his head sinking down into space. Rest has improved his general condition, though at times he falls as of old. Catheterization has no effect on the hearing or tinnitus. The right ear feels as if filled with a foreign body. The hearing of the right ear is moderate, that of the left ear fair, and all forks are heard well. Bone conduction is doubtful, but better in the right side.

Static test : wavering to the left with eyes closed. Dynamic tests good, except in rotation when he bends his knees.

The instillation of cocain and insufflation of cocain vapors improved the hearing and tinnitus. His mental condition improved, but it is doubtful if it will remain permanent, as from the history of the case the brain is probably affected. I base this opinion on his behavior on the goniometer, when his angle of inclination was nearly normal.

CASE 20.—Mr. 4, æt. thirty-five ; soft chancre in 1883 ; drinks heavily. In 1894, whilst intoxicated, fell six M, on the right side, was taken home unconscious, bled from the right nostril, and remained a week in bed. No otorrhœa. On rising from his bed excessive vertigo, decreasing at the end of two weeks.

He soon returned owing to renewed attacks of vertigo, inability to walk straight, and tinnitus in the right ear. Iodide of potassium in large doses ; vertigo ceased, but tinnitus remained. The iodide was continued all summer, and ether blown into the ear for the tinnitus. Deafness as before, memory weak, drinks a good deal, gets easily tired, writes as plainly as ever. Pupils react well, but right more than left.

Drumheads opaque and sunken ; slight nasal catarrh.

Hearing of right ear for A. C. bad, loud voice not perceived, but high forks on contact. Left ear normal. By B. C. all tones localized to the left.

Eyes open, static tests normal ; eyes closed, static tests all to the right, and backward. On the goniometer anterior and other inclinations normal, except right foot outside inclination is only 4° .

Dynamic tests good with eyes open ; with eyes closed curious deviations in jumping and hopping, only to be shown in figures. Generally speaking, the patient starts well, then deviates to the

left, then stamps his feet, hops to the right, and then falls to the ground. Or, after jumping to the right, he falls backward. Again, he jumps zigzag, and falls to the right and backward. The rotatory tests are curious ; he turns part way round and then suddenly slides to the right ; and from that position turns a little more to the right, and then slides again and finally falls to the right.

CASE 21.—Miss —, æt. twenty-three, has often seen objects double, and during nausea, green ; the color being formerly attributed to ascarides. Has had measles with otorrhœa and obliquity of the body to the left ; after some months the discharge ceased, and hearing was restored. When fourteen she suffered from occasional diplopia, and at fifteen accidentally hit herself on the forehead, the blow being followed with persisting pain. Last winter she got cold from living in a damp house, tinnitus set in, and attacks of vertigo and falling.

Brief description of a typical attack :

Sounds begin as if coming from afar, first as the rustling of trees, then like music, then like a roaring or rattling. The ears feel stopped up. This prodromal stage lasts several seconds. Objects now begin to look green, and vertigo ensues. Objects move from right to left, the bases remaining steady, the tips nodding forward. Later, objects seem to fall to the left and backward on the patient. If the eyes are closed the vertigo disappears. Nausea is often present. Sometimes all objects vibrate. The body moves to the left to prevent loss of equilibrium, and she clings to the sofa or bed. Occasionally the head alone is bent forcibly to the left, and nods like a bird in pecking at food. The heart beats forcibly, breathing is difficult. Finally the patient gives prolonged deep sighs and the attack is over.

Rapid motions favor an attack. The patient cannot taste bitter things without a tendency to nausea and an "attack."

Treatment : Hoffmann's elixir.

Static and dynamic tests a year later showed inclination to the left and backward, though with the eyes open the tests were nearly normal.

Three per cent. cocain instillations into the ear produced sleep. The vertigo gradually grew worse. Astigmatism was discovered and proper lenses ordered. The vertigo persisting, the glasses were more carefully fitted, but nevertheless no improvement obtaining, liq. ferri albuminati was given. Pain in the

feet remained a constant symptom. Gradually the patient improved, and the vertigo disappeared. She could work better with glasses, her gait became nearly normal, and all tests were good.

A portion of the symptoms were due to anæmia, and a portion to astigmatism, but whether the anæmia of the labyrinth or of the entire brain was the exciting cause, remains doubtful.

CASE 22.—Dr. M., æt. forty-four; poor family history of heart disease and congenital affection of the eyes, has always been anæmic, and suffered from bronchitis with hæmoptysis.

About five years ago, after severe mental labor, he suffered from hyperakusis, dizziness in walking, weakness of the eyes, and pain in the left temporal region. At a summer resort he gradually lost his hearing from damp winds. All treatment of the deafness in the left ear, and of the subsequent tinnitus, remained useless. In the following year the right ear also became affected. All of the symptoms were referred to neurasthenia. Hypnotism and galvanization were useless. The hearing decreased rapidly. Various specialists referred the now nearly total deafness to neurasthenia, others to a labyrinthine affection, or to ankylosis of the ossicles. The treatment suggested was iodidum potassii, ignipuncture in the occipital region, insufflation of æthereal iodoform.

In the following year the condition was diagnosed as a disease of the auditory nerve or auditory centre. Franklinization was of some help. Proper hypermetropic lenses were worn. The hypodermatic use of strychnin nitrate was followed by diminution of the tinnitus. Pilocarpin and arsenic were employed, but followed by sleeplessness, and loss of what hearing had been regained. Electricity, sulphur baths, mercurial ointment, iodid. potassii, were tried, but the rapid deterioration after fifteen inunctions of the ointment caused it to be stopped.

In 1893 the patient grew worse. He was finally treated with spermin and the vision which was at one time poor gradually increased so that the former lenses were dispensed with.

Present condition, amblyopia congenita, presbyopia, drum-heads concave, tubes open, constant tinnitus in the day but not at night. The tinnitus ceases on lying down. It is generally of a tertian type, worse every third day; on the first day it is slight, on the second worse, and on the third it is so intense that the patient finds no rest and feels almost insane. This periodicity has been marked day in and day out for years. Opening and closure of the eyes is accompanied with a metallic noise in the

ears. He sleeps well from 11 to 3, and then awaking remains so the rest of the morning.

Smell and taste good, no vertigo, handwriting normal, knee reflex good, no headache, can lift objects from the floor, buttons his coat easily, stands rapidly from his chair and walks along, but soon begins to sway and to tire, and then to stumble about. At evening his gait is unsteady. With his eyes closed he can move about easier in the morning than in the evening.

Hearing for speech and music lost, but sawing, cracking, clothes brushing, ticking of clock, ringing of bells, etc., are well perceived. The right ear alone can hear the following tones : fork 128, Koenig 10,240.

Static tests with the eyes open are maintained with effort, the single-leg ones being rather unsteady. With the eyes closed he falls forward, and from either leg alone he falls to the opposite side. Goniometer angle normal with eyes open, and only 9° or even 7° with eyes closed.

The dynamic tests with eyes open show wavering gait, labyrinthine jumps, hopping noisy, rotatory tests accomplished with great effort. With eyes closed, he falls backward at times, sometimes right and back, and then again left and back, according to the leg on which alone the hopping and rotation are attempted. As a rule, all the static and dynamic tests are indifferently performed, and the patient falls in either direction, showing an affection of the peripheral terminal apparatus. *Finally, when the tinnitus is at its worst, the disturbances of equilibrium are much more marked.*

In concluding this long paper, I would remark, that the examination of persons suffering from diseases of the ear may be of medico-legal importance. Thus I lately saw a case in which a railroad employee asked for damages after an injury to the head with subsequent and (as it was thought) simulated loss of hearing. The officials refused to pay for the alleged loss of hearing. The examination made before the legal authorities revealed serious disturbance of equilibrium, which alone made the man incapable of active employment. I pointed out to the medical experts employed by the railroad the significance of these disturbances based on my experiments as here laid out in detail, and on their recommendation the company paid the damages claimed.

A CASE OF ACQUIRED TOTAL DEAFNESS, THE RESULT OF INHERITED SYPHILIS; WITH POST-MORTEM.

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In October, 1891, a lad seventeen years of age, who was said to have become completely deaf during the previous six years, was brought to me at the Ear, Throat, and Nose Department of the Poliklinik.

His mother reported that he had been a weakly boy at birth and had continued delicate until five years of age. When seven years old his eyes became "inflamed," for which condition he was under treatment as an out-patient at the Glasgow Eye Infirmary for over two years. He was sent to school when eight, but before the session had closed the teacher recommended that he should be kept at home until his eyes were well and until his hair, which had begun to fall out, leaving bare white patches, had grown again. At eleven his scalp was free from patches, his hair was healthy and well grown, and his eyes were well and strong—that is, the redness and tenderness due to the inflammatory process had subsided, but his sight was bad, chiefly from the presence of corneal opacities.

While this improvement was taking place his hearing was becoming impaired; the left ear appeared to be first affected, but soon both were implicated, and at the end of six months he was totally deaf. The transition from the state of hardness of hearing to that of total deafness appeared to have taken place very suddenly. His mother described how she heard him sobbing bitterly one morning while lying in bed, and as she approached him he exclaimed, "It's awa' a' together!" and from that time he was totally deaf.

Family History :

Inquiries into the patient's family history elicited facts illustrative of the terrible ravages resulting from the introduction of syphilis by a spouse.

The mother of the patient was fifty years of age when she came to consult me regarding her son.

She was married when twenty-three, and the following particulars of the results of her fourteen pregnancies are interesting :

First—A healthy male child born at full time. This boy died when six years old from inflammation of the lungs. Shortly after the birth of this child, the mother appears to have contracted syphilis, the early constitutional symptoms of which seem, from her own account, to have been severe and well marked. While so affected she became pregnant a second time ; and within fifteen months of her first confinement was delivered of a still-born female child at the seventh month.

Third—A male child born near the end of the seventh month, and which lived ten hours.

Fourth—Male twins in the eighth month, one still-born, the other survived two days.

Fifth—A female child still-born in the seventh month.

Sixth—A female child at full time. She is still alive and apparently in good health.

Seventh—A miscarriage in the third month.

Eighth—A female child still-born in the seventh month.

Ninth—A miscarriage just over the third month.

Tenth—The patient, now seventeen years old.

Eleventh—A female child at full time, still alive and in fairly good health.

Twelfth—A miscarriage in the third month.

Thirteenth—A female child at full time who died from measles when two years old.

Fourteenth—A miscarriage in the fourth month—this occurring five years ago.

Patient's condition when first examined.—The lad, who was described as having formerly been bright and smart, was listless and stupid, and he was thin and anæmic. His forehead was somewhat prominent, his nose well formed, the cornea of both eyes was of ground-glass appearance generally, with several patches of distinct opacity, his incisor teeth were serrated, his

palate high and narrow with prominent transverse ridges, and his voice was monotonous.

When his hearing became first affected he complained of severe pain in both ears and of loud noises in the ears and head, but these had long since disappeared. He never had discharge from either ear, nor any history of middle-ear disturbance.

To the sound of the voice, the tuning-fork, and loud bell he was totally deaf. Occasionally in his eagerness he said he heard the tuning-fork when placed over his mastoid, but this occurred quite as often when the tuning-fork was at rest as when vibrating.

Both meatuses were normal in form and appearance, and both tympanic membranes were intact, slightly indrawn, and somewhat whiter than the normal.

Over the right parietal eminence there was a prominent swelling, smooth, hard, and painless, the base of which measured an inch and a half long by fully one inch broad. It was explained that two years previously he was struck by a piece of wood on the right side of the head. Considerable pain followed the receipt of the injury and a swelling resulted which had gone on increasing in size. Several similar, though smaller, swellings over other parts of the head had been observed in the interval, but these had disappeared, in some cases after days, and in others after weeks.

The use of gray-powder and the regular application of mercurial ointment were prescribed, though with but small hope of benefit accruing. At the end of six weeks he returned and his mother reported that he could hear the rumbling of carts passing along the street, and he himself, from this fact, felt hopeful of further improvement. No change, however, could be discerned on using the various tests, but as his general health had markedly improved, continuance of the treatment was advised.

While he remained under observation his general health steadily continued to improve, and he was able to do some work in connection with his father's bakery. Increase in the size of the swelling (gumma) over the right parietal region was noted from time to time. At the end of six months from date of first observation there was no doubt but that he could hear the sound of a vibrating tuning-fork by osseous conduction for about one fourth of the length of time it was audible to a normal ear.

I did not again see him until requested to meet the family attendant on the 12th of June, when I learned that shortly after

his last visit to the dispensary (March) the swelling on the head began to discharge watery fluid, and then to break down and give rise to a highly fetid discharge; and for this reason he had been kept at home.

On the morning of the 10th of June he had worked for some hours "baking and firing," and having finished he washed himself and sat in front of the kitchen fire to read. While so engaged the book fell from his hands several times, and on his mother's correcting him for his apparent carelessness she noticed that his hand twitched and he became convulsed on the left side and would have fallen from the chair had she not caught hold of him. When laid in bed it was found that he had paralysis of the left arm and left leg. On the following night he had a second seizure in which his convulsive movements were less marked and chiefly affected the face.

I found him much emaciated, conscious, and intelligent, though he spoke with difficulty. The area occupied by the swelling was now nearly as great as the right parietal bone itself, and the swelling was fungus-like, composed of broken-down inflammatory tissue, together with sloughing scalp and brain tissue. I recommended his removal to the hospital, which, however, was not accomplished till the 16th. On the morning of the 17th June he was put under chloroform, the scalp thoroughly cleansed, and the sloughing material cleared away. I then removed a considerable part ($1\frac{1}{2}'' \times 2''$) of the right parietal bone, wholly necrosed, and this permitted a large quantity of very fetid pus to escape. In the ward journal it is reported that "paralysis of the left arm and leg and left side of the face, present on admission, became more marked shortly after operation. There is also during renewal of dressings considerable protrusion of more or less disorganized brain-substance through the opening in the skull. He continued fully sensible and fairly well till the 22d, when swallowing and breathing became difficult and he died somewhat suddenly in the afternoon of that day. He had no convulsions after the operation."

A **post-mortem examination** was made next day and the following is an abstract of the report:

"The surface generally is pale and the body very spare. There is a gaping partly incised wound near the summit of the head to the right of the middle line, the anterior border of which is immediately above the external meatus.

This wound is occupied in its middle part by a soft hemorrhagic mass which projects through an opening in the skull. There is a considerable gap in the *dura mater* to which the brain-substance is partly adherent. A corresponding gap is in the brain-substance, which may be in general described as involving the ascending parietal convolution, except its lower extremity, and a considerable part of the parietal lobe. At the base there is considerable purulent infiltration of the soft membranes extending somewhat into the Sylvian fissure.

" Along the right border of the liver numerous deep cicatrices, but no actual gumma, were found. The thoracic and abdominal organs generally were found to be in a highly amyloid condition.

" The right temporal bone was removed and placed in an acid solution for section.

" On examining the bone externally, the small size of the mastoid process was the only feature in which it appeared to deviate from the normal.

" The bone was then bisected, cutting through the long axis of the petrous portion, thus exposing the external meatus throughout its length, the tympanum, the anterior portion of the cochlea, and the internal auditory meatus.

" The external auditory meatus was found normal in appearance; the tympanic membrane thin and translucent and free from adhesions. The malleus was healthy and normal in size and form. The incus, which was displaced during section of the bone, was healthy; but the base of the stapes was incorporated with, or ossified to, the border of the foramen ovale and so had become immovably fixed to the inner wall of the tympanum. The lining membrane of the tympanic cavity was intact and the Eustachian tube patent.

" The tympanum was of average size, the attic well developed, but there were no interstices in the bone posteriorly *i. e.*, the mastoid bone which as stated was unusually small was solid.

" The internal auditory meatus was next examined. At its inner extremity it was of average normal calibre, and both the auditory and facial nerves contained therein were healthy. But tracing it outward at a distance of 1 *cm* from

the inner opening, the upper wall became suddenly thickened, encroaching on the canal and at a farther distance of 3 *mm* the canal was almost completely obliterated.

"The vestibule was so greatly encroached upon as to make it doubtful whether any portion of this space remained. The cochlea was readily examined and was of average size, but the modiolus and lamina spiralis ossea were so thickened as to occupy an unusually large proportion of the cavity of the cochlea. Of the semicircular canals only a trace of the external (horizontal) one could be found, the remaining portion of this part of the labyrinth being lost in a mass of dense bone of ivory hardness.

"The chronic inflammatory process which had led to such extensive new-formation of bone-tissue was, I think, undoubtedly syphilitic in character. It resulted in solidification of the usually spongy mastoid, in the obliteration of the outer third of the internal auditory meatus, with consequent destruction of the vitality of the auditory nerve, and it not only thus cut off the internal auditory meatus from the internal ear, but it resulted in the obliteration of a large portion of the labyrinth itself, and all this up till the end with no other result than complete loss of hearing."

THE UPPER-TONE LIMIT IN THE NORMAL AND
DISEASED EAR, AS DETERMINED
BY THE GALTON WHISTLE.¹

BY H. A. ALDERTON, OF BROOKLYN, N. Y.

THE work accomplished by Siebenmann, Bezold, and Zwaardemaker in determining the upper-tone limit elicited in the normal ear by means of the Galton whistle has been so thorough and so well thought out that any further work in the same direction must be mainly with the idea of comparing the reactions of another Galton whistle with theirs. Some slight differences, mostly unimportant, are sure to exist, leaving, however, the general principles but the more firmly established.

The Galton whistle, forming as it does our most convenient, and, next to the Koenig rod, our most reliable means of finding the upper-tone limit, still has its limitations, these, however, applying more particularly to the extreme upper portion of the scale, where the whistling sound is so apt to be confused and obliterated by the puffing or blowing sound produced by the superabundant air over and above that necessary to bring out the musical note. The precautions necessary to reduce this to a minimum become quickly apparent to the user of the instrument, and therefore space forbids their introduction here. Suffice it to say that, as a result of the experiments of Bezold and others, it has been found that the reactions of the normal ear to the Galton whistle vary between the divisional mark of 1.25 on the scale for children, and 3.03 (Bezold) or 4.8 (Zwaarde-

¹ Read before the American Medical Association of Baltimore, May, 1895.

maker) for the aged, according as you accept the finding obtained by the one or the other investigator.

For practical purposes, it is sufficient to know that from 1.25 in childhood the upper-tone limit normally descends until, in persons over sixty years of age, from 3. to 5. is indicated on the scale. The writer has been able to confirm the results arrived at so far as young people are concerned, but the great difficulty of finding any number of aged people with normal ears, and still more with normal mental endowments, who could be induced to lend themselves to experimental purposes, has so militated against his success that he feels inclined to leave that portion of the field in abeyance, simply expressing the opinion that such work as he has done points rather to the more moderate reduction (3.03) noted by Bezold.

The study of the upper-tone limit in the pathological state has been touched upon by a few investigators, more or less sporadically, but especially by Siebenmann. So far as the writer knows, however, the results have not been arranged systematically by any one in English, with the possible exception of Dench.

The writer examined, during the year 1893, some five hundred pathological cases, and takes pleasure in presenting the results for whatever of value may be inherent in them. In the following table the ages and the Galton responses are averaged, and compared with the normal reactions at ages corresponding to the average age of the pathological cases studied. In all the cases enumerated throughout this paper, the diagnosis was arrived at by a comparison of the objective and subjective symptoms; the watch, whisper, and entire series of tuning-forks being used in conjunction with the Galton whistle, the last often being held back until after the diagnosis was made. In the diagnosis the result of treatment was considered when recorded. Through some oversight, or more probably because of a desire not to prolong the agony of patients suffering from otitis media purulenta acuta, the writer was very much surprised in collating to find that the reactions of not a single case had been taken in such manner as to fulfil the requirements of a scientific

study, either the tuning-forks, whisper, or Galton having been dispensed with.

Table.

DISEASE.	Number of Cases.	Average Age.	Average Galton.	Normal Galton at Same Age.
Cerumen.....	11	31	1.58	1.51-.58
O. M. C. Sub.....	6	24	1.55	1.37
O. M. C. A.....	3	31	1.97	1.5
Tubal Catarrh.....	8	37	1.58	1.6
Tubal Obstr.....	31	12	1.6	1.35
O. M. C. C.....	56	30½	1.83	1.45
O. M. P. C.....	18	25	2.02	1.37
O. M. P. R.....	5	19	1.78	1.35
O. M. Resid.....	22	19	1.97	1.35
Labryinthine Anæmia.....	4	20	1.5	1.36
Neurasthenia.....	13	28	1.6	1.37
Hysteria.....	1	15	.8	1.35
Nerve.....	70	43	2.7	2.1
O. M. C. C. et Int.....	198	41	2.98	1.95
O. M. Res. et Int.....	28	40	3.09	1.8
O. M. P. C. et Int.....	7	43	2.64	2.1
Tubal Obst. et Int.....	7	27	2.45	1.36½
O. M. C. Sub. et Int.....	6	56	3.95	2.85

Because of the limited number of cases in some of the diseases, it is possible that the results in these diseases are valuable merely as indications of about what may be expected through investigations in the future. Taken as they stand, it would seem as though certain deductions were permissible; for instance, that in non-inflammatory diseases of the external canal the upper-tone limit is not lowered, *i. e.*, is normal. That, comparing the average of the tone limit in middle-ear diseases with that in the normal ear, a lowering of from .18 to .55 is noticed, with the exception of the limit in cases of tubal catarrh, and here the number of cases is so small and the chance of similitude so great that the writer defers and gives his adherence to the results obtained by Siebenmann, which coincide with the results of all the other middle-ear diseases. That in functional affections of the

labyrinth or nerve, the upper-tone limit is very slightly impaired and may even be elevated in hyper-sensitive conditions. That in labyrinthine or nerve diseases the average upper-tone limit is .6 below the normal, many of the cases in the table being pure nervous cases at their inception. That combined middle- and internal-ear diseases are capable of producing a lower average upper-tone limit than internal-ear disease alone. Since both middle- and internal-ear disease have the tendency to lower the upper-tone limit, it is but natural to expect that when combined they should produce a lower reaction than when either exists alone.

While it is true that in general the Galton and Schwabach tests give logical and corresponding responses, *i.e.*, lowered upper-tone limit and lessened duration of B. C. are accompanied by lessened perception of whisper and watch; still there are numerous cases giving conflicting and confusing responses. Thus in old age the upper-tone limit may be diminished out of proportion to the B. C., which may be fairly good throughout. Cases of apparently uncomplicated middle-ear disease with good Galton, intensity —R, and whisper not bad, may have impaired B. C. In one case of O. M. Residuosa, the Galton may be reduced and not in another, both having apparently normal nerve reactions.

Often, however, an apparently confusing reaction when studied is found to conform to the formulas given above: Thus, in some cases of Res. et. Int. one ear may have as good as or even better B. C. than the other, but the intensity —R will have climbed higher up the scale and the whisper and watch be heard worse. In the former the Galton may be worse and also the A. C. will be absent farther up the scale. This is explained when it is remembered that middle-ear conditions while increasing the duration of B. C. and impairing A. C., may also diminish Galton.

Variations in otitis interna: you may have duration of B. C. good, intensity + R throughout, and whisper and watch heard fairly, and yet Galton be considerably shortened, —up to 2.7; or whisper, watch, A. C., and Galton impaired, and yet B. C. be normal or nearly so.

Also, in nerve cases, great impairment of duration of

B. C., especially for the higher forks, may be present and yet Galton be very good. In fact, in beginning nerve lesions the higher forks may show diminished duration of B. C. before Galton is impaired. This probably indicates an enervation or weakening of perceptive ability—a condition of nerve tire. Even great diminution of watch, whisper, A. C., and hiatuses in B. C. may co-exist and yet the Galton be but little impaired.

The gravity of the nerve lesion is not always indicated by Galton or Schwabach tests. The B. C. may not be heard at all from C' up, and yet the Galton be heard comparatively high—3.1 to 2.2,—the whisper and watch being heard comparatively well; while B. C. may be heard from C" down or throughout, but watch and whisper zero and Galton 6.7 to 5.8.

Apparently the state of the nerve as exemplified by duration of B. C. may be better in one ear than in the other, and yet the Galton be heard better in the ear with the poorer nerve.

Variations in cases of O. M. C. C. et Interna: A case may give no indication by tuning-fork that there is any other than a nerve lesion, and yet Galton is normal or nearly so, and catheterization gives improvement to hearing. Or the other ear shows by tests such a mixed condition to exist.

With the other tests giving very similar responses, the Galton in one ear may be much worse than in the other. Or with other tests similar, the B. C. may be better in the ear with the poorer Galton, and this ear may show improvement on treatment, whereas the other ear may not.

You may have whisper and Galton worse in one ear than in the other, and yet the duration of B. C. be better in the poorer ear.

You may have an hiatus in the B. C., and yet the whisper, watch, and Galton be only moderately reduced.

Some cases give even better Galton and B. C. in one ear than in the other, but the whisper is heard not so well, and the A. C. is found much less than in the other, and the — R extends higher up the scale.

There exists no doubt in the writer's mind that when a sufficient number of these exceptional cases are brought together the explanation of the apparent deviation from the foregoing formulas will be brought to light, and that more experience will but prove that thorough testing of the hearing ability in most pathological conditions will be the necessary preliminary to a scientific diagnosis and therapy.

THE TREATMENT OF POLYPI AND GRANULATIONS.

By URBAN PRITCHARD.

THE following short annotation upon my method of antiseptic treatment in connection with the removal of polypi and granulations will, I trust, be of interest to some of my confrères ; for although it is but the application of those antiseptic principles now generally adopted in modern surgery, yet the results accruing from its use have been so satisfactory that some account of it may be acceptable to our readers.

For three or four days before operation the affected ear is thoroughly syringed out, three times daily, with a 1 in 40 warm solution of carbolic acid.

On the morning of the operation the auricle and cartilaginous meatus are thoroughly purified with a 1 in 20 solution of carbolic acid ; the deeper meatus and middle ear are again syringed with the 1 in 40 solution, and this is followed by an instillation of the same strength, or of 1 in 20, if the ear will tolerate it, as it often does. Of course with children and susceptible adults it is necessary to be somewhat more sparing in the use of carbolic. The instillation is allowed to remain in the ear for ten minutes or a quarter of an hour, the head being inclined over to the opposite side ; it is then allowed to run out, the cartilaginous meatus is lightly plugged, and the auricle is covered, with double cyanide gauze (wrung out in 1 in 20), and a bandage is applied over the whole.

Before commencing the operation, which is carried out

under strictly antiseptic precautions as regards the instruments, the surgeon's fingers, and everything that is brought in contact with the parts, the ear is again syringed with the 1 in 40 solution; and after the removal of the polypus or granulation has been effected, its base is well curetted and any carious spots thoroughly scraped; the blood and débris are then syringed out with 1 in 40, and a plug of double cyanide gauze is lightly packed down on to the affected area, care being taken to dissolve out the irritating soluble cyanides from the gauze by first thoroughly wringing it out in a 1 in 40 carbolic solution. Finally, a dressing and bandage are applied to the auricle.

The subsequent dressing depends upon the progress of the case. As a rule, this requires to be changed only every second or third day; no syringing is necessary, and the case may be entirely healed within seven or eight days. The presence or absence of pain, temperature, or discharge determines the question of whether the dressing should be renewed more frequently or not. Sometimes a slight sero-mucous discharge remains which requires instillations of alcohol in order to complete the healing. In cases where the otorrhœa does not cease promptly the surgeon will have to resort to the ordinary treatment; *i. e.*, frequent syringing, alcoholic instillations, etc., but even with these such treatment will be much shortened by this antiseptic method of procedure. And not only is it of value in this respect but it also may be said practically to abolish all risk of septic infection.

It is scarcely necessary to point out that in these highly septic cases mere aseptic treatment is valueless.

A CASE OF LIVING LARVÆ IN THE EAR WITH- OUT PREVIOUS SUPPURATION.

By WILLIAM C. BRAISLIN, M.D.,

ASSISTANT SURGEON, AURAL DEPARTMENT, BROOKLYN EYE AND EAR HOSPITAL.

REPORTED cases of maggots of dipterous insects found in the aural canal, in which purulency was not the existing and acting cause of their occurrence, are rare.

The writer has been able to find four instances recorded, namely that reported by Dr. Gruening at a meeting of the New York Ophthalmological Society in 1882; one in the ARCHIVES OF OTOTOLOGY, vol. xx., No. 1. by Baxter who refers to a similar case of Dr. Kuntzmar. A case was likewise reported in the ARCHIVES OF OTOTOLOGY, vol. xxiv., Nos. 3 and 4, by C. W. Richardson.

The larvæ, of which in the present case there were five, were, so far as can be determined, those of the Texas screw-worm fly (*Lucilia macellaria*).

A fact of great interest in connection with this case, in view of a possible solution of the question "How and why were they placed there by the parent insect?" was the co-existence of a fœtid nasal catarrh.

It is well known that flies of this class, while in the larval stage, feed on carrion, and that the parent seeks such matter, attracted by its odor, and, guided by the sense of smell, thus finds a place suitable for the deposition of her eggs. That the sense of smell alone determines the place of their deposition is shown by Dr. Blake (ARCHIVES OF OTOTOLOGY, vol. ii., No. 2), who found that the blue-bottle fly deposited her eggs on a piece of silk from which some putrid meat had been

but recently removed. In the following case the probable focus of attraction for the parent insect seemed to be an odor originating in the nose of the patient.

The history of this case is as follows:

Sam Eis, a barber of German birth and Hebrew parentage, twenty-five years of age, came to consult me at nine o'clock on the morning of July 22, 1895.

He complained bitterly of pain in the right ear, stating that it had existed since twelve o'clock the preceding night when he was awakened by it. The ear felt as if there was something in it. To relieve this symptom he had "dug at" the ear with a pin, following which there was oozing of a small quantity of watery, bloody material.

He had never had pain or any trouble whatever of the ear up to this time and he knew no reason for the present attack. The pain extended forward to the eye of the same side. The eye looked watery and the tissue about it seemed somewhat swollen so as to slightly close it. Examination revealed nearly normal hearing.

On first inspection of the ear nothing to account for the severe pain was observed. There was a slight amount of redness about the short process. Closer inspection revealed, on the walls of the canal among fragments of exfoliated epithelium, small white objects with curious "vibrio" movements which suggested the lashing motion of certain bacteria seen under microscopical examination. There was no perforation of the membrane.

Vapor of chloroform was blown into the canal. The ear was then syringed. Among the small masses of epithelium were five small maggots.

Pain in the ear now stopped entirely and the pain complained of in the right eye was said to be "easing up" too.

When seen a few days later the patient stated that all symptoms subsided following the syringing and that no trouble in the ear had since existed.

The patient, whom I have known in his tonsorial capacity for several years, was unable or unwilling to communicate any facts which might throw any light on the time or manner in which the eggs, from which the larvæ hatched, were deposited in the auditory canal.

He denied being under the influence of liquor, but said he had

been at Coney Island the day preceding (Sunday), and while there had taken a surf bath.

It has often been the experience of observers to find, in cases of maggots occurring in the aural and nasal canals, that the patient has slept soundly or has been in complete or partial alcoholic narcosis out-of-doors at some time shortly preceding the onset of symptoms.

The larvæ were white, except that at one extremity a small black line showed the alimentary canal; they were each 2 mm in length.

The size of the larvæ in this case was very small, showing that pain was developed at an early period of their growth. This we may suppose to have been due to two reasons. First, that the auditory canal, being free from chronic suppuration, was in a normally sensitive condition; secondly, that the maggots, from lack of pus to feed upon, were compelled to make active inroads into the living tissues earlier in their life-history than they find necessary in cases of chronic suppuration.

Unfortunately the species of larvæ in this case was not absolutely determined.

Immediately after syringing the pus from the canal, one of the larvæ which still showed signs of life was placed in a piece of raw flesh, with the design of determining the exact species by allowing it to develop into a perfect insect. The hope of its perfecting itself was not realized.

It is, however, highly probable that the larvæ were those of the screw-worm fly, *Lucilia macellaria*,¹ which has been figured and described in several agricultural bulletins, being of economic importance by reason of its destructiveness to cattle. These flies are usually attracted by the odor of decomposing matter or open sores, and laying their eggs therein thus propagate their species.

In the absence of any odor of pus from the ear we were led to look for a cause elsewhere which might have served

¹ Specimens of the larvæ of this species were kindly sent to me by Dr. M. Francis of the Texas State Agricultural College, to which the specimens of the case under consideration bore a close resemblance, while they resemble not at all those of the *Musca* or blue-bottle genus.

to attract insects whose instincts lead them to select localities for the deposition of their eggs where fœtid or decomposing odors are present.

A fœtid atrophic rhinitis from which the patient is a sufferer seemed to the writer to be the undoubted focus of attraction for the fly which, from some cause determined by instinct, deposited her eggs within the canal of the ear.

A CASE OF PAPILLOMA OF THE TONSIL; REMOVAL.¹

By JOHN B. ROBERTS, M.D.,

PROFESSOR OF SURGERY IN THE PHILADELPHIA POLYCLINIC AND TO THE WOMAN'S MEDICAL
COLLEGE OF PENNSYLVANIA.

I REPORT the following case because the condition is a rare one.

A girl of eighteen years came to the Woman's Hospital for treatment of a tumor of the left tonsil which had been growing for two years. Inspection made it evident that it was not hypertrophy of the tonsil. A large dendritic growth projected from the tonsil nearly all the way across the fauces, occluding the orifice of the pharynx and lying upon the root of the tongue. She complained, however, of no special symptoms, as far as I can remember, except the inconvenience produced by the bulk of the mass at the back of the mouth.

I operated on March 16, 1894, cutting away a large portion of the tumor with the tonsillotome; and then removing other portions by means of forceps and a blunt-pointed bistoury, because the base of the mass was too large to go into the ring of the tonsillotome. I then prescribed a gargle of alum and tannic acid.

Three weeks later I cut away a small remaining portion with the forceps and bistoury. I looked upon the tumor as a papilloma. This diagnosis is confirmed by Dr. Joseph McFarland, who says: "The tumor is dendritic, covered with squamous epithelium, and consists of lymphoid tissue principally. It ought from its histology to be a perfectly benign tumor, and not return. I suppose it grows from the tonsillar tissues."

¹ Read before the Section on Otology and Laryngology of the College of Physicians of Philadelphia, December 3, 1895.

I present the specimen which is in several pieces. It is a mass larger than an ordinary black walnut. It is deposited in the Mütter Museum of the College.

The patient has not been seen by me since a few weeks after operation.

Dr. H. T. Machell reports in the *New York Medical Journal* of January 19, 1895, an instance of a similar tumor of both tonsils occurring in a girl aged ten years. In his case the duration of the disease was about two years. He says that both tonsils were closely packed with papillary bodies, and that the child showed alteration in voice and in facial expression, had difficulty in swallowing, and was deaf. The tumors, which were ragged in appearance because of the pedunculated masses of which they consisted, filled the throat, hiding the uvula and resting on the base of the tongue. The growths extended down the throat as far as he could reach with his finger. Before treatment was adopted the child died from intercurrent scarlet fever. After death Dr. Machell readily enucleated one of the masses with his finger.

The photograph of this tumor shows gross appearances identical with the growth presented to the Section this evening. The microscopical report of the tumor so removed by Dr. Machell was made by Dr. John Caven as follows: "Microscopic examination of the tissue shows it to be *lymphadenoid* in nature. Unfortunately, improper hardening and preservation have so deteriorated the structure as to render sections very unsatisfactory. However, it is really a true hypertrophy of tonsil, tonsillar tissue being reproduced. Whether congenital or not I cannot determine. I have not been able to find a reference to an exactly similar condition in any work; the nearest to it is a papillomatous condition of the mucosa of the pharynx resulting from chronic pharyngitis. I would compare it with post-nasal adenoids."

The occurrence of papillomatous tumors in the tonsil must be exceedingly rare.

Boswell, in his work on *Diseases of the Nose and Throat*, says that all benign growths are comparatively rare in the tonsil, and explains the fact by calling attention to the retrograde changes that occur in the tonsils of adults, which make it a less likely seat of such neoplasms than other organs. In children, on the other hand, the tonsils are his-

tologically more susceptible to morbid processes; but at that period of life innocent tumors are less apt to occur than in adults. Since benign morbid growths are rare at the period of life when the activity of the tonsils is greatest, we can readily understand the infrequency with which surgeons meet with such tonsillar tumors.

Bosworth gives the notes of nine cases of fibroma of the tonsil which he has succeeded in finding recorded in medical literature, and also refers to one case of fibro-chondroma, one of fibro-lipoma, and one of fibro-lymphadenoma in this situation.

Papilloma, though apparently almost unknown in the tonsils, is the most common innocent tumor developed in the soft palate, uvula, and pillars of the fauces. It and adenoma are quite frequently seen in this situation. Bosworth has been able to find recorded but seven cases of fibroma and but three of angioma occurring in these structures.

In no text-book of diseases of the throat which I have examined have I found any reference to the occurrence of papilloma of the tonsil. My search, however, has not been exhaustive.

FURTHER OBSERVATIONS ON THE INDICATIONS FOR MASTOID OPERATIONS IN ACUTE PURULENT OTITIS MEDIA AND ITS COMPLICATIONS.¹

By H. KNAPP.

IN a paper on the above subject published in the July and October number of the ARCHIVES OF OTOLGY, 1895, one of my conclusions (No. 3, p. 267) was:

Even if a patient does well, and seems cured, we should, for weeks and months, not lose sight of him.

I communicated in support of this thesis three cases which, after a temporary, non-operative convalescence, had severe relapses. Two of the three were cured by a mastoid operation; the third, in which the patient after the primary improvement withdrew from treatment and had not been operated on, ended fatally from suppuration of the mastoid with perforation into the posterior cranial and digastric fossæ and subsequent meningitis. To these cases I can add two of my recent practice which seem instructive enough to be published. The first is briefly mentioned in my former publication, being then still under treatment. His history is as follows:

CASE I.—Acute Purulent Otitis Media, with Mastoid Involvement, Glandular Swelling, and Facial Paralysis—Operation—Complete Recovery.

Jac. Krupnikoff, Hebrew, thirty-seven, family history good. Well until Sept. 22, 1895. Sudden pain in right ear, from a bath

¹ Read before the Section of Eye and Ear Surgery in the N. Y. Academy of Medicine, January 20, 1896.

the day before. Pain two days, discharge, relief. Return of pain in ear, extending to head, eleven days later.

Admitted to hospital Aug. 6, 1895. Stringy purulent discharge from right ear. Mastoid tender, especially over the tip and the lower and medial surface. Defect in inferior part of *Mt.* Auditory canal narrow, walls not bulging. When pus is wiped out, it soon appears again, coming mostly from the postero-superior part.

Hearing fair. Temp., evening, 100.5°. Urine, normal.

Treatment: Rest in bed, Leiter coil. Pain rapidly disappeared; temp. normal. Discharged Aug. 10th to be treated in Dispensary. Felt well until Aug. 21st, when he had severe pain on and below the mastoid. Discharge free, diminished night of Aug. 23d.

Readmitted Aug. 24th.—Considerable redness and swelling over and below right mastoid and right side of face. Skin doughy, sensitive and pitting on pressure. No fluctuation. Small amount of stringy discharge. Temp. 100°. Leiter coil.

Aug. 25th.—More swelling. Gland over angle of lower jaw swollen to the size of a walnut. Complete facial paralysis. Discharge scant. Walls of canal swollen. Leiter continued.

Aug. 26th.—Symptoms no better.

Operation.—Long incision. Bone reddish. At upper part of antrum pit a fold of periosteum entered into the bone. On chiseling underneath it the antrum was found empty. The cells below it contained a moderate quantity of thin pus. Granulation tissue and considerable pus were found in the tip. A probe passed through the tip freely into the digastric fossa. The insertions of the sterno-cleido-mastoid and digastric muscles were cut away clean from the tip, and the whole outer surface of the mastoid was removed. In the medial surface of the mastoid there was a large defect. In the digastric fossa no pus was found and none could be obtained by stroking the heads of the above muscles from below up. The periosteum was stripped from the digastric fossa inward and forward, in order to see whether there was no fistula leading into the posterior cranial fossa. While this was done a smooth, blue surface, soft to the touch with a probe, was noticed, apparently the bulb of the *internal jugular vein*, after its emergence from the jugular foramen.

Neither pus nor a fistula being found, I scooped out the mastoid cavity toward the antrum. While cleansing the rough medial surface with a sharp spoon, suddenly a large quantity of dark

blood welled out—*injury to the lateral sinus*. The hemorrhage was easily stopped by plugging with corrosive sublimate gauze. The operation being finished anyhow, I dressed the wound and sent the patient to bed. No reaction from the operation, except that for three days the swelling went farther down the neck, along the severed muscles, whereas it diminished in the other places.

Aug. 29th.—Dressing changed, no bleeding, wound perfectly sweet; dressed with boric acid powder, light plugging. General condition of patient good. Temp. normal.

Aug. 30th.—Swelling of neck almost gone. Facial paralysis less marked; no discharge. Temp. normal.

Patient improved rapidly. Discharged Sept. 14th. Wound almost closed; no more pain; symptoms of paralysis of facial still present, but less marked. No otorrhœa.

Patient was treated in Dispensary. Otorrhœa, swelling of tissues, and facial paralysis completely disappeared.

Examined Nov. 22d.

A linear scar 45 mm long, depressed, no fossa. Ear canal normal. *Mt* slightly irregular; short process and handle in position; light reflex divided, but bright. Other ear the same aspect.

R (operated ear): $h \frac{1}{2}$; L $\frac{3}{4}$. Voice $\frac{1}{8}$ each. F, A < O; from vertex louder in ear stopped up. Patient is cheerful, attends to his business (grocery) without any discomfort.

Jan. 25, 1896.—Seen the last time; is perfectly well and has had no trouble since the operation.

REMARKS.

The patient had an ordinary acute attack of purulent otitis media which improved rapidly, when on the third day discharge had set in. Having a relapse eleven days later, he was admitted to the hospital, where by rest in bed and antiphlogistic treatment (Leiter's coil) his temperature fell from 100.5° to the normal, and he felt so well that in four days he could be discharged for treatment as an out-patient.

In eleven days again he had another severe relapse, with rise of temperature, swelling over the angle of the lower jaw, and complete facial paralysis. The Leiter coil this

time did not benefit him, so that I operated on him two days later. The mastoid was extensively laid open, and the exterior table from the antrum down to the tip removed. There being communication with the digastric fossa, I detached the muscle-insertions completely and stripped the periosteum off forward and inward till the bluish bulb of the internal jugular vein was seen. While curetting the brittle inner wall of the mastoid with a sharp spoon the sigmoid sinus was wounded. The convalescence was undisturbed, and the patient left the hospital nineteen days after the operation. He recovered perfect hearing, perfect mobility of the face, and has been free from discomfort ever since.

The *facial paralysis* was most probably caused by perforation of the Fallopian canal and pressure of the inflammatory product (pus) upon the nerve in the lowest, subtympenic, part of its course. This part in many specimens is surrounded by numerous air cells, in which, in the case under observation, the suppurative inflammation was particularly marked. In support of this supposition I may call to mind that the stylo-mastoid foramen, through which the nerve passes, is situated at the anterior end of the mastoid groove. In the case under consideration the probe passed readily from the mastoid cavity into the groove. It is not likely that the soft parts outside the mastoid, though considerably swollen, could have exerted sufficient pressure to paralyze the nerve.

Another case, in which the remission of the symptoms after paracentesis of the drum membrane and the setting in of the discharge was, however, not very marked, is remarkable by its course, during which in the sigmoid sinus and at the bottom of the middle fossa the dura mater had been exposed, with perfect absence of any subsequent reaction. Not infrequently are the symptoms in purulent otitis media equivocal, yet so grave that an exploratory opening of the cranial cavity is recognized as a legitimate procedure. Our case is another illustration of the fact that this operation can be done without injuring the patient.

The case is as follows:

CASE II.—Acute Purulent Otitis Media, with Marked Cerebral Symptoms—Paracentesis of Drum-Membrane—Opening of the Mastoid, with Exposure of the Lateral Sinus, as well as the Dura Mater at the Bottom of the Middle Cranial Fossa—Recovery.

Mrs. B. Odorowsky, Hebrew, æt. forty-nine, having undergone some operations on several parts of her body in Russia, but apparently of a healthy constitution, had at the beginning of Nov., 1895, an operation performed on her left clavicle, which has left a linear scar of $2\frac{1}{4}$ inches in length. Two weeks later the left ear began to ache, this being the first time in her life that her ears had given her any trouble. Not finding relief in a few days, she went to the N. Y. Ophthalmic and Aural Institute and had a paracentesis performed. The ear discharged and felt easier for several days, but when it pained again she went to the Dispensary of the Mt. Sinai Hospital, where cold applications to the mastoid and syringing of the ear were ordered. This treatment afforded her some relief, but soon the earache returned with increased vehemence, and was accompanied by intense pain over the whole left side of her head. In the evening she sent for her family physician, who, the next day, sent her to me.

I found the discharge stopped, the *Mt* entire, the upper posterior part at the depth of the ear canal red and slightly swollen, and excessive tenderness by pressure on the posterior edge of the mastoid process, on a level with the upper end of the orifice of the ear canal. Pain and a sensation of heat in head. No nausea, no dizziness. I ordered her quinine 0.75 three times daily, rest in bed, warm ear douches, and cold applications to the mastoid.

She felt relieved for a few days, then the pain in the ear and head increased, the posterior part of the mastoid became slightly puffy and very sensitive on pressure; the remainder of the mastoid, in particular the antrum pit and the tip, as well as the muscle-insertions on it, free from pain. The ear canal was normal; the drumhead had re-formed, was pinkish, not bulging anywhere. Temp., 99° , pulse 70. No changes in fundi of eyes. Urine normal. Voice, $\frac{1}{2}$; watch, $\frac{9}{12}$.

My opinion was that the purulent inflammation of the middle ear had subsided in the tympanum and antrum, but was still active in the posterior part of the mastoid, involv-

ing the bony wall of the sigmoid groove, with perisinuitis, and possibly epidural abscess.

I admitted her to the hospital Dec. 7, 1895, and *operated on* her Dec. 9th.

A slightly curved incision was made 1 *cm* behind the insertion of the auricle. After the periosteum was scraped aside, an opening was chiselled into the antrum, and enlarged up and down. The bone was very hyperemic, but the antrum as well as the upper and lower cells were free from pus and granulation tissue.

An incision through skin and periosteum was then made from the antrum directly backward a few lines beyond the posterior edge of the mastoid process. The bone was chiselled in the same direction. At a depth of about 4 *mm* the bone near the posterior edge was vascular, and a bead of pus made its appearance. Chiselling deeper more pus was found. The bone was frail, cancellous, and filled with granulations. These and the brittle bone were removed with a sharp spoon. Thus a cavity was dug, the bottom of which on probing felt so soft that I received the impression as if the bony wall of the sigmoid groove had also been removed, so much the more as the probe could be introduced 4 or 5 *mm* along the bare inner surface of the bone cavity. The bone in the tip of the mastoid proving hard and free from pus and granulations, I abstained from extending the operation in that direction.

Dec. 10th.—Patient had pain in wound until midnight, then felt comfortable.

Dec. 11th.—Had a bad night; pain in vertex and temple depriving her of sleep. The wound dressed; it was clean and odorless: no elevation of temp., pulse 67.

Dec. 12th.—No pain at night, but considerable in vertex and wound since morning. Wound discharging pus, looks healthy. Tip of mastoid red and sensitive to pressure.

Dec. 13th.—Had a good night, no pain. Wound dressed, in good condition. Discharge of pus. Pain over mastoid has left.

Dec. 22d.—Patient had good days, alternating with bad ones. Her appetite, which had been almost altogether wanting, returned in a measure. Bowels regular, with a tendency to diarrhœa. On her bad days she felt very weak, the pain in head became very intense, extended to the shoulder, and was accompanied by

nausea, vertigo, and chilliness. Temp., 99° ; pulse, 60; resp., 30. She felt better when the wound discharged.

Dec. 23d.—Patient excessively feeble, almost in a stupor. Temp., $99\frac{1}{2}^{\circ}$; pulse, 72. Fundi oculorum normal, as always before. No tenderness on pressure on any part of the mastoid, nor at the head or along the border of the sterno-mastoid muscle.

On account of the aggravation of the symptoms, it was thought that a focus of suppuration had not been reached, and the marked cerebral symptoms made it likely that the pus had extended into the cranial cavity either through the roof of the tympanum, or through the inner table of the mastoid. The tip of the mastoid, freely open on its upper side, and showing no symptoms in its point and its surroundings, in particular none in the digastric fossa, was not considered likely as being the cause of the prolonged disturbance. Epidural abscess and perisinuitis were supposed to be the most probable complications. Sinus-thrombosis was excluded on account of the absence of the temperature-curve characteristic of this affection.

Operation Dec. 23, 1895.—Under ether narcosis the wound was thoroughly cleansed of all the healthy granulation tissue which in the process of repair had sprung from the bottom and the sides. The wound was chiselled larger and the *sigmoid sinus laid bare to the extent of 2 cm.* The bone wall of the sulcus was vascular and brittle, but there was no pus; the sinus was bluish, clean, well filled, soft, and pulsating. Regular circulation in it being evident, no attempt was made to ascertain the quality of the blood by an aspirator needle.

The integrity of the posterior cranial fossa thus being sufficiently established, I enlarged the wound upward and forward with a chisel until I had *exposed a circle of the dura mater at the base of the middle cranial fossa of a little more than 1 cm in diameter.* No pus was found there either; the dura mater had its normal appearance, and pulsated regularly. Under these circumstances, not feeling justified in extending the operation any farther, I cleansed the wound with corrosive sublimate gauze, dusted some boric acid powder in it, and tamponed it with sublimate gauze. The patient felt better for four days, and the wound did not discharge. Then the pain in the head returned, with chilliness, followed by heat

(temp., $99\frac{1}{2}^{\circ}$) and great weakness. The next day was good, then again an attack of headache, nausea, dizziness, chills, and heat. Quinine was ordered, 0.50 to 1.00 grm. daily.

While changing the dressing, the wound was curetted in every direction where the bone was soft, especially *down the tip, where there was diminished resistance toward the lower surface* (mastoid groove). There was no pus anywhere, nor had there been any secretion after the last operation, but a moderate amount of brittle bone could be scooped out from the lower-posterior part of the tip.

From this time on the patient steadily improved. The headache diminished, the wound became clean and gradually filled up from the bottom, without producing exuberant granulations. The quinine, which seemed to have a beneficial effect upon her recovery, was kept up in doses of 0.60 daily. On Jan. 2, 1896, the *Mt* was found entire, pinkish all over, and in normal relief; conversational voice was understood through the room.

Having become virtually free from pain, and growing stronger, with appetite and digestion good, she was dismissed from the hospital as cured Jan. 10, 1896. Her disease had lasted a little over two months.

Jan. 17, 1896, I examined her again. She was quite well, no pain. The wound was in good condition, closing. The *Mt* in normal position, somewhat dull. $h = \frac{3}{4}$, in the other ear $\frac{1}{2}$; $v = \frac{1}{2}$, in the other $\frac{3}{8}$. F, A > O (tuning-fork better by aërial than osseous conduction).

REMARKS.

The history of this case shows the sudden onset of a purulent otitis media in a previously healthy ear. After several improvements and aggravations, she came to me with the middle ear in a fairly good condition of recovery, the mastoid in its anterior, middle, superior, and lower portions free from any visible or tangible abnormality; the posterior border, however, and the adjacent occipital region were puffy, pink, and very tender to the touch. That there was suppuration in this locality seemed evident. I located it in the cells near the inner cortex, probably affecting the cortex itself, possibly with deposit of pus in the sigmoid groove. The operation verified the supposition, yet not to

its full extent. After a remission of several days, cerebral symptoms (headache, nausea, vertigo, chilliness, and a moderate rise of temperature), as well as great prostration, made it appear likely that the suppuration had extended into the cranial cavity. The posterior cranial fossa was opened, the lateral sinus and the dura of the middle cranial fossa were exposed, but no suppuration was found. After an improvement of a few days quotidian or tertian attacks of chills and fever set in. They were improved by quinine. The wound exhibited a good condition, yet, on probing, the cells of the tip felt soft and yielding, especially toward the infero-posterior aspect. A few days previously the tip had been tender for one day. I curetted it, and found the medial portion particularly brittle. After this, a steady and complete recovery took place.

The case illustrates the gradual progress of the suppuration from one part of the middle ear to the other, especially its different stages in the mastoid. The operation probably prevented its entrance into the posterior cranial fossa, such entrance having occurred in the fatal case (No. 4) of my above-mentioned paper, but the final recovery did not begin before the last focus, in the tip of the mastoid, had been stamped out.

The case furnishes this rule for guidance: *As long as there are grave and protracted symptoms of middle-ear disease, we have to seek for their anatomical cause, in doing which exploratory openings of the cranial cavity are legitimate, because they are practically harmless, and sometimes may save the patient's life.*

A FURTHER¹ CASE OF ANCHYLOSIS OF THE
STAPES DIAGNOSTICATED IN LIFE, WITH
AUTOPSY AND MANOMETRIC AND HISTO-
LOGICAL EXAMINATIONS.²

BY PROF. F. BÉZOLD, MUNICH.

HISTOLOGICAL EXAMINATION BY DR. SCHEIBE.

(*With three figures on Plate I., Vol. XXVI., Germ. Ed.*)

Translated by Dr. WARD A. HOLDEN.

IN the functional auditory tests as I have performed them for years, gradually perfecting them in various directions, I have had a higher purpose than the mere confirming and refining of the diagnosis of diseases of the ear.

Apart from the difficulty of involving the different parts of the ear in the lower animals by operative procedures, we cannot get satisfactory results from auditory tests with them, but the daily clinical study of ear diseases offers us a wealth of auditory disturbances.

The conditions governing the functional tests of the ear are more favorable than in the case of any other sense organ, since there are two methods of testing, viz., by air- and by bone-conduction, and the results obtained in these two ways may be compared for each tone. The introduction of the continuous series of pure tones has enabled us to analyze the function of the auditory organ completely, and from the characteristic disturbances peculiar to the different changes in the conducting apparatus, and the breaks due to laby-

¹ "A Case of Anchylosis of the Stapes," ARCH. OF OTOL., vol. xxiii., p. 48;
² and a paper read at the third meeting of the German Otological Society at Bonn.

rinthine involvement, we have discovered a whole series of partial auditory defects which occur in constant fashion.

In many cases it is also possible to discover the changes which give rise to these defects. The cause of the defects which are due to destruction or fixation of various parts of the conducting apparatus can often be recognized by examining the ear in life, and we can also produce many of the defects by operative procedures, such as removing or disarticulating certain parts, incising the drum membrane, tenotomizing the muscles of the interior, removing the ossicles, etc. When, however, the drum membrane is intact, or when the affection is located in the labyrinth or in the fenestræ, it is only by collecting the records of many autopsies that we are gradually placed in a position to understand what changes produce the defects shown in the functional examination in life.

This is the way and, in my opinion, the only way to build up a physiology of the ear which can give, with our present clinical knowledge, a satisfactory insight into the extraordinary capabilities of the normal organ of hearing.

This course is sufficiently praiseworthy in itself, but it will bring with it a change in the relations of otology to general medicine, and lead to a more general recognition of the importance of otological study.

For years I have collected all the clinical observations that seemed to be of value for physiological purposes. At the third meeting of the German Otological Society I presented a case of bony ankylosis of the stapes with functional examination and autopsy, to which I can now add another similar case.

E. R., a student, aged twenty-four, was seen October 4, 1888. He had been hard of hearing for seventeen years, and there had been continuous tinnitus. A brother and sister were hard of hearing.

The left *Mt* is normal; the right *Mt* has an atrophic scar in its lower half.

Whisper heard, $\left\{ \begin{array}{l} \text{right, 6 cm,} \\ \text{left, 25 cm.} \end{array} \right.$

The fork A placed on the vertex is perceived in the left ear,

and is heard 15 seconds longer ; a^1 on the vertex is also perceived in the left, the time not noted.

Rinné, with A, was on both sides,— δ .

Rinné, with a^1 , $\left\{ \begin{array}{l} \text{right,—10 seconds,} \\ \text{left,—9 seconds.} \end{array} \right.$

Lower tone limit : C^{-1} to F^{-1} were not perceived by air-conduction.

The diagnosis was *sclerosis*, with *anchylosis of the stapes*.

As the continuous series of tones had not been employed at this time, it was determined only that the forks C^{-1} to F^{-1} were not perceived by air-conduction. According to all my experience, however, the defect extended still higher. The test with Galton's whistle was not made.

An entirely analogous condition was found two years later in a brother aged twenty-one, who was examined with the continuous series.

Mt normal, excepting a radial striation of the cone of light.

Whisper heard, $\left\{ \begin{array}{l} \text{right, 35 cm,} \\ \text{left, 25 cm.} \end{array} \right.$

(The hearing distance of the left ear was the same in the two brothers, and therefore a comparison is the more valuable.)

Fork A on the vertex, + 18 seconds.

Rinné, with a^1 , $\left\{ \begin{array}{l} \text{right,—7 seconds,} \\ \text{left,—10 seconds.} \end{array} \right.$

Upper tone limit, $\left\{ \begin{array}{l} \text{right, } C_2 \\ \text{left, F.} \end{array} \right.$

Upper limit for Galton's whistle, $\left\{ \begin{array}{l} \text{right, 2.1,} \\ \text{left, 2.} \end{array} \right.$

Similar tone limits may be assumed for the left ear of the elder brother. For the right, deaf, ear the limits were certainly not so wide.

In both brothers there was found the triad of functional symptoms, which for me is characteristic of fixation of the stapes, viz., lengthened bone-conduction for low tones, marked negative Rinné, and extensive defect in air-conduction at the lower end of the scale. The elder brother had also a large scar in the drum membrane, due to an earlier suppurative process that must have been long healed, since the patient had no recollection of it.

Five years after the examination the elder brother succumbed to a profuse hemorrhage in the course of phthisis, and I obtained both auditory organs.

No further decrease in hearing had been noticed by the patient or his friends in the five years since his examination.

Macroscopic.—Right: The lower half of the drum membrane is occupied by a kidney-shaped scar, sharply outlined, transparent, and level with the remainder of the drum, which has a white opacity in its upper half.

The tympanic cavity is free from secretion and its mucosa is pale, that of the antrum being perhaps more opaque. From the inner surface of the drum membrane the lower end of the handle of the malleus projects as a free process covered with mucous membrane.

The crura of the stapes are of extraordinary delicacy, and the obturator membrane between them is wanting. By means of a sound it is found that the stapes is completely immovable, and the crura break under very slight pressure from in front. The white color of the foot-plate is in contrast with the neighboring wall of the tympanic cavity.

The mastoid region is sclerotic (from the previous inflammation), and the antrum contains only a few cells.

The tube is difficult to catheterize, owing to curvature; and it contains a glassy mucus, but the mucosa is of normal appearance.

On the left side also the tympanic cavity is empty, and the ossicles and mucosa are normal. The exceedingly thin crura of the stapes on this side broke in the dissection. Here also the obturator membrane is wanting. As on the other side the foot-plate is brought into contrast with the surrounding bone by its white color.

Manometric Examination.—A manometric examination was undertaken on the right side before the tympanic cavity was opened, with the following results: Insufflation of air through a tube placed in the auditory canal caused a rise of $\frac{1}{2}$ mm in the fluid of the labyrinth manometer, and sucking out the air caused it to fall $\frac{1}{2}$ mm. Condensation of the air through the tube caused a rise of 2 mm, and rarefaction a fall of 2 mm, the small figures being due to the fact that the tube had been injured in removing it and was consequently not air-tight. With the tympanic cavity opened, insufflation and suction in the canal caused no movement of the fluid in the labyrinth monometer, indicating that the motion before the cavity was opened was due to the round window only.

A style 10 *cm* long cemented to the head of the malleus moved outward 1 *mm* when the air in the canal was condensed, and 10½ *mm* inward when it was rarefied. When cemented to the body of the incus it moved ½ *mm* and 2 *mm*.

The manometric examination thus showed a complete immobility of the foot-plate of the stapes and a limitation of the movement of the malleus and incus, possibly due in part to the previous suppurative process, but which could be fully explained by the fixation of the stapes.

Histological Examination.—Both temporal bones were decalcified and cut in serial sections, vertical, and perpendicular to the upper edge of the pyramid.

The mucosa of the left side is normal, of the right that on the promontory particularly is thicker, poorer in nuclei, and contains fewer blood-vessels. The epithelium is flatter.

The number of muscular fibres is reduced in the tensor tympani of each side. The stapedius muscle is well developed on the left side and poorly developed on the right. The transverse striations are not well marked at various points in each muscle.

In the malleo-incudal articulation, which was cut on the right side, only the meniscus could be followed through the entire joint. The articular surface of the head of the stapes is unchanged on both sides, and the membrane of the round window is also normal.

Very marked changes were found, however, at the stapedio-vestibular symphysis on both sides. Even with the naked eye one sees in the sections a slight thickening of the bone at the margin of the pelvis ovalis, and a very marked thickening of the foot-plate of the stapes.

The deposit about the pelvis ovalis consists of spongy bone, poor in medulla, and extends in the left ear only through the region of the lower margin, while on the right side it occupies the entire promontory up to the niche of the round window, and involves to a less extent the upper margin of the oval window. There is no sharp line of demarcation between the spongy and the compact bone.

The thickening of the foot-plate is more marked on the right side, and in places it is five times the normal thickness. It includes the entire extent of the foot plate on both sides, but is more excessive in the middle than at the margins. Only the tympanic surface of the foot-plate has been thickened, and this is rough while the labyrinthine surface is smooth. Thus the foot-plate in section has the form of a plano-convex lens with the convexity toward the tympanum.

The periosteum on the tympanic side is much thickened.

The hyperplastic bone, into which both foot-plates are transformed, consists of spongy material with many medullary cavities and some giant-cells. Both in the pelvis ovalis and in the foot-plate, particularly on the right side, there are large lacunæ filled with dense connective tissue. No tubercle bacilli were found.

The cartilage, where it is preserved, is abnormal. Its cells are small, the protoplasm is darker stained, and the nuclei are often wanting.

The foot-plate of the stapes not only touches the margin of the oval window at many points, but is in part united to it by bone. On the right side there is bony union above, while the annular ligament is preserved below; on the left there is a small bony union above. On both sides the adjacent surfaces are broad and uneven, corresponding to the thickening of the foot-plate, so that, even where there is no bony union, motion would seem to be impossible.

Figs. 1 and 2, Plate I, represent a vertical section through the right and left foot-plates, the left cut nearly through the centre, the right cut farther back. Fig. 3 represents a normal foot-plate for comparison.

The cochlea and the remainder of the labyrinth appear normal in so far as the preservation of the elements warrants a judgment.

As the cause of the functional disturbance observed in life we find the same osseous hyperplasia that was present in my previously reported case. In this case the process seems to have run its course, the bone is fully formed, there are few giant-cells, and none of the young osseous tissue that was found in the previous case.

The particular value of this case consists in the localization of the process to the stapes and its neighborhood. On the left side, excepting the pelvis ovalis, the entire organ was normal. And the changes in the drum membrane of the right side are of no great importance, for such changes are found in ears with nearly normal hearing.

Thus, excepting the marked changes at the oval window on each side, there are neither in the tympanum nor the labyrinth changes which could explain the deafness. The autopsy, therefore, leaves us no other course than to believe that the symptom-complex found in life is the functional expression of the changes found at the autopsy in the stapedio-vestibular symphysis.

There are now five ears in which, after making this diagnosis in life, that condition was found at the autopsy. There are also several observations by other authors of stapes anchylosis being found after death when at least negative Rinné has been found in life.

So far as it may be demonstrated in a pathological way, I consider as proven the theory advanced when my first case was published, that whenever the three symptoms mentioned are present in a noticeable degree, the pathological change producing them is a fixation of the conducting apparatus at its most efficient point, viz., the oval window.

The effect of this fixation on the complicated lever apparatus represented by the chain of ossicles with the drum membrane and the annular ligament, is a purely mechanical one, and it is indifferent whether this is brought about by ossification in the stapedio-vestibular symphysis, by calcification of the annular ligament, by adhesions of the foot-plate of the stapes, or by analogous processes between the crura of the stapes and the wall of the pelvis ovalis.

A very important paper by Politzer, "Primary Disease of the Labyrinth Capsule," these ARCHIVES, 1894, p. 255, appeared after the above paper was in print. He confirms the results of my examinations, and the paper is also highly instructive on other points.

FIFTH INTERNATIONAL OTOLOGICAL CON-
GRESS, HELD IN FLORENCE, SEP-
TEMBER 23 to 26, 1895.

REPORTED BY T. BOBONE, OF SAN REMO.

Translated by Dr. A. B. KIBBE, Seattle, Washington.

The reception took place September 22d, at the residence of Prof. Grazzi.

The sessions were held in the Istituto degli Studi Superiori.

FIRST DAY'S SESSION, MONDAY, SEPTEMBER 23D, 10 A.M.

Presiding Officer : PROF. GRAZZI.

Members Present :

- | | |
|-------------------------------------|---------------------------------------|
| 1 <i>Arslan</i> , Padua. | 20 <i>Cresswell-Baber</i> , Brighton. |
| 2 <i>Avoledo</i> , Mailand. | 21 <i>D'Aguanno</i> , Palermo. |
| 3 <i>W. IV. Baldwin</i> , Florence. | 22 <i>Daly</i> , Pittsburg. |
| 4 <i>Barr</i> , Nice. | 23 <i>Damato</i> , Naples. |
| 5 <i>Benni</i> , Warsaw. | 24 <i>Damieno</i> , Naples. |
| 6 <i>Bianco</i> , Turin. | 25 <i>Delie</i> , Ypres. |
| 7 <i>Bobone</i> , San Remo. | 26 <i>Delstanche</i> , Brussels. |
| 8 <i>Boucheron</i> , Paris. | 27 <i>De Roaldes</i> , New Orleans. |
| 9 <i>Brieger</i> , Breslau. | 28 <i>Dundas Grant</i> , London. |
| 10 <i>Browner</i> , Bradford. | 29 <i>Ferreri</i> , Rome. |
| 11 <i>Browne, Walton</i> , Belfast. | 30 <i>Ficano</i> , Palermo. |
| 12 <i>Brunetti</i> , Venice. | 31 <i>Galetti</i> , Milan. |
| 13 <i>Buscaroli</i> , Imola. | 32 <i>Gellé</i> , Paris. |
| 14 <i>Capart</i> , Brussels. | 33 <i>Goris</i> , Brussels. |
| 15 <i>Chiucini</i> , Rome. | 34 <i>Garzia</i> , Naples. |
| 16 <i>Coldstream</i> , Florence. | 35 <i>Gouguenheim</i> , Paris. |
| 17 <i>Conopelo</i> , Vienna. | 36 <i>Gradenigo</i> , Turin. |
| 18 <i>Coosemans</i> , Brussels. | 37 <i>Grazzi</i> , Florence. |
| 19 <i>Corradi</i> , Verona. | 38 <i>Heiman</i> , Warsaw. |

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| 39 <i>Helme</i> , Paris. | 56 <i>Pietkowski</i> , Radoin. |
| 40 <i>Kirchner</i> , Würzburg. | 57 <i>Politzer</i> , Vienna. |
| 41 <i>Knapp</i> (<i>Arnold</i>), New York. | 58 <i>Putelli</i> , Venice. |
| 42 <i>Krzywicki</i> , Königsberg. | 59 <i>Rici</i> , Savona. |
| 43 <i>Locatelli</i> , Pesara. | 60 <i>Rutten</i> , Nemours. |
| 44 <i>Lubet-Barbon</i> , Paris. | 61 <i>Secchi</i> , Bologna. |
| 45 <i>MacNaughton-Jones</i> , London. | 62 <i>Secretan</i> , Lausanne. |
| 46 <i>Madeuf</i> , Mont Dore. | 63 <i>Semon</i> , London. |
| 47 <i>Martin</i> , Paris. | 64 <i>St. Clair Thompson</i> , London. |
| 48 <i>Masini</i> , Genoa. | 65 <i>Steele</i> , Florence. |
| 49 <i>Moltisanti</i> , Syracuse. | 66 <i>Stone</i> , Liverpool. |
| 50 <i>Mongardi</i> , Bologna. | 67 <i>Suñe y Molist</i> , Barcelona. |
| 51 <i>Morpurgo</i> , Trieste. | 68 <i>Szenes</i> , Budapest. |
| 52 <i>Moure</i> , Bordeaux. | 69 <i>Urban-Pritchard</i> , London. |
| 53 <i>Numa-Campi</i> , Livorno. | 70 <i>Verdos</i> , Barcelona. |
| 54 <i>Okuneff</i> , St. Petersburg. | 71 <i>Zapparoli</i> , Mantua. |
| 55 <i>Palozzolo</i> , Agira. | |

Professor GRAZZI opened the Congress with a pleasant speech of welcome, deplored the loss of such prominent colleagues as Professor Moos, Sapolini, Longhi, von Tröltsch, Joly, Helmholtz, and Tofoni, and declared the Fifth International Otological Congress opened.

Professor POLITZER spoke in memory of Professor Moos, lately deceased.

Professor Grazzi was elected President, and Drs. Benni, Bobone, Cresswell-Baber, and Chiucini Secretaries to serve during the Congress.

SECOND SESSION, MONDAY, SEPTEMBER 23D, 3.30 P.M.

President : PROF. GRAZZI.

GELLÉ, Paris : **The General Treatment of Diseases of the Ear.**—In diseases of the ear which so often occur in connection with constitutional or hereditary syphilitic, or still more often with infectious conditions, general treatment is indispensable. Prophylaxis was first discussed by calling attention to the many ways of infection in the fœtus, the infant, and the child.

Heredity was then taken up, the infectious processes in the mother during pregnancy, errors in hygiene, and in dietetics, all causes of intestinal inflammation in children, and of atrophy and suppuration. How frequently the ear reacts with a suppurative inflammation under these circumstances is well known.

The speaker then reviewed the general treatment of *otitis acuta*. Such treatment may in the beginning be abortive, particularly in cases of *oto osteoperiostitis infectiva*, such, for example, as occur in connection with influenza when general treatment, although not markedly successful, is still not useless. The various indications in *otitis grippalis*, *otitis rheumatica*, *guttosa*, etc., were fully treated.

The general treatment in *otitis media chronica* must be based on its etiology; tuberculosis, scrofula, syphilis, diabetes, cachexia, pregnancy, etc.

The next portion of the paper was devoted to the general treatment of cases of *otitis chronica*, characterized by attacks of dizziness. Here the indications are to modify the irritability of the nerve centres and the labyrinth. Those forms which present subjective disturbances of hearing must be grouped under a particular clinical type, and may be treated by various general internal as well as external means. The last chapter was devoted to hardness of hearing in general. Here the treatment by suggestion, hypnotism, and electricity was mentioned.

In all forms of ear disease it remains certain that local treatment is of prime importance, while general treatment, though not to be undervalued, must always remain secondary.

ARSLAN, Padua.—**Adenoid Vegetations.**—In connection with the opinion expressed by Gradenigo and Corradi, Arslan maintained that adenoid vegetations were more frequent in Italy than was generally believed. Among 4080 patients affected with disease of the ear, nose, or throat, adenoid vegetations were found 426 times, or in 10.7 per cent. As far as the etiology is concerned the author was of the opinion that the damp climate was not of such great importance. Dyscrasia and heredity play a more important role.

The various complications were then reviewed, which the author divided into two groups. The first included diseases of the ear, inflammation of the upper air-passage, and nose-bleed; the second, reflex symptoms. Treatment was extensively described. Brief anæsthesia with bromide of ethyl, rapid removal of the growths in one sitting when possible. The instrument used was usually Moritz Schmidt's knife.

Discussion.—CORRADI and GORIS recommended Gottstein's curette and anæsthesia.

HELMÉ said that prior to the age of fourteen cocaine should not be used, as it did not repress the patient's fright. The effect of

bromide of ethyl is too short. The introduction of the finger into the post-nasal space might produce infection.

GRADENIGO observed that the method of the operator cannot always be the same. In children who have never been operated on, the operation may be made without an anæsthetic. He preferred chloroform to bromide of ethyl; after the operation douching is unnecessary as the blood is really the best antiseptic.

PRITCHARD operates under anæsthesia produced by inhaling a small amount of ether mixed with a special gas [what the special gas is the original report does not state. TR.]. He uses an antiseptic solution as a wash.

MOURE expressed the opinion that anæsthesia is indispensable in many cases. Complete removal of the vegetations is not necessary; only those should be removed which prevent free breathing or interfere with the functions of the tubes.

SECRETAN called attention to the frequency of adenoid vegetations in Switzerland.

DUNDAS GRANT uses nitrous oxide as an anæsthetic, begins the operation with the finger and completes it with either scoop or forceps.

BOBONE believes adenoid vegetations occur in Italy fairly frequently, but not on the sea-coast. He had seen very few cases on the Riviera.

OKUNEFF.—Auscultation of the Sclerosed Mastoid.—The method consists in placing on the mastoid a small vibrating tuning-fork, which is connected with the (examiner's) ear by aid of a rubber tube. Varying thickness of the bone produces variations in the sound of the fork.

Discussion.—MORPURGO had repeated Okuneff's experiment, but arrived at no positive results.

AVOLEDO.—What results have been produced on the deafness accompanying suppurative inflammation of the middle ear by intratympanic surgery?

Discussion.—FICANO asked whether the improvements enumerated by Avoledo were to be looked upon as really the results of removal of the drumhead and extraction of the hammer, or whether they were not more likely due to the traction on the stapes which ruptured the adhesions between the foot-plate and the fenestra ovalis.

POLITZER fails to find in Avoledo's address any mention of the intratympanic operations in the region of the inner wall of

the tympanum, which for acoustic results are more effective. He had reference to cutting the cicatricial bands which lie between the foot-plate and the fenestra ovalis, as well as those which often bind the hammer to the inner wall of the drum cavity. Similar results are also obtained by resection of the posterior fold.

GRADENIGO desired to be better informed on one point. It appeared that Avoledo had spoken of acute middle-ear suppuration producing complete deafness in a few days. He was of the opinion that in such cases the patients were very nervous, syphilitic, or tuberculous.

MORPURGO.—Intratympanic operations made for acoustic purposes may cause a return of the suppuration; the extraction of the incus is not seldom followed by facial paralysis. Conservative treatment often gives unexpected results.

GELLÉ mentioned the sequelæ which often follow surgical operations in the drum cavity, and which are often evidence that the disease lies in the terminal cells of the mastoid.

DUNDAS GRANT had often seen undoubted improvement after a complete loosening of the posterior ligament of the hammer, whereby a more complete washing out of the cavity and removal of cholesteatomatous masses were possible.

MOURE remarked that disease of the upper anterior part of the tympanum often depends on caries or necrosis of the hammer, which should be extirpated.

DELSTANCHE also observed that in disease of the attic extraction of the hammer, combined with washing out the cavity and cauterizing with solutions of zinc chloride, often cured the otorrhœa. In exceptional cases only was he forced to extract the incus or open the mastoid.

COOSEMANS.—**A Case of Horn of the Auricle.**

THIRD SESSION—TUESDAY, SEPTEMBER 24, 9 A.M.

President: PROF. POLITZER.

GRADENIGO.—**The General Treatment of Otitis Interna.**—The author was of the opinion that specialists neglected to be biologists, physicians, and surgeons, and have overlooked the connection between the ear and the organism in general.

As a consequence our reliance was for years placed solely on the air douche. The discovery of the connection between diseases of the ear and those of the pharynx gave the assistance of surgery to our therapeutics. By his discovery of adenoid vegetations,

Meyer gave to otology a great impulse, which was completed by a knowledge of the pathology of the temporal bone. The otologist is not yet however sufficiently a physician. It is the diseases of the inner ear particularly which may be influenced by general treatment. Otitis interna may be hereditary or acquired. The acquired form is often associated with either syphilis or rheumatism. In the syphilitic form early treatment often gives brilliant results, particularly the internal use of iodides and intra-muscular injections of mercury. In the rheumatic form general treatment is of little or no avail. Hydrotherapy, by increasing the resistance of the cutaneous system and diminishing the frequency of inflammations of the naso-pharynx had given the best results in connection with local treatment. The prognosis of otitis interna consecutive to otitis media in consumptives is always bad. Improvement is only possible when the general condition improves. Good results had been obtained in trade-labyrinthitis by the use of iodides. Patients suffering from otitis interna of hereditary origin, Gradenigo divides into three classes: 1. Tubercular, or those coming from tubercular families. 2. Syphilitics. 3. Those in whose family analogous forms of otitis exist. In the first two groups heredity must be considered in the sense that here the organism possesses a diminished resistance to the pathogenic cause. Here internal treatment has not fulfilled our hopes. In the syphilitic form specific treatment improves but does not cure the condition. In the tubercular, long-continued administration of the iodides is followed by some but very slight results.

Discussion.—MORPURGO spoke briefly of the advantages of the air douche, and with VON TRÜLTSCHE was not afraid of the entrance of micro-organisms into the drum cavity. As far as general treatment was concerned all methods were uncertain, excepting the specific treatment of syphilis.

BRIEGER.—Primary Otitis of the Mastoid.—The writer reported a case of acute disease of the mastoid, with, in the beginning, an evanescent collateral participation of the drum cavity, in which the form described by Bezold of a perforation through the incisura mastoidea developed. The operation, two months after the onset of the disease, showed beneath thick intact cortex a cavity of the size of a walnut, containing granulations, a small amount of pus, and a sequestrum still showing diploic quality. On the under surface a thin, broad scale of perforated bone still remained. In addition, a gravitation abscess was present beneath

the sterno-cleido-mastoid. The drum cavity had remained free after the disappearance of the exudation which it contained at the onset of the disease. It is very rare for a true otitis of the mastoid to develop in connection with infectious diseases. In typhoid only, according to his experience, is there a possibility of the development of primary otitis of the mastoid. In diabetes also it is highly improbable.

The rarity of primary tuberculosis of the mastoid, as well as the difficulty of its recognition, was also referred to. It is usually very difficult, occasionally impossible, to demonstrate the presence of tubercle bacilli in the granulations or pus.

FOURTH SESSION—TUESDAY, SEPTEMBER 24, 3.30 P.M.

President: PROF. GELLÉ.

CORRADI: Traumatic Perforations of the Drumhead from Indirect Cause Viewed Particularly from a Medico-Legal Standpoint.—Corradi reported in brief the various causes of indirect perforation of the drumhead. In cases where compression of the air in the external meatus had taken place, the author had come to conclusions which coincided with those of Politzer, but the form and locality of the perforation produced by a kick or blow upon the head vary if associated with a fracture of the bony parts. In cases where no bony fracture is present the perforation lies at the periphery of the drumhead. The conditions which make the perforation possible in the latter cases, are a condition of tension of the drumhead produced during life by a contraction of the oto-muscular apparatus and favored by the presence of alterations such as dry and hyperplastic forms of catarrh, or in addition atrophy or cicatrices of the drumhead near its periphery. The author reports three cases where such a perforation occurred. They are, however, rare, and always imply the action of a certain amount of force. From this it is possible, according to the location of the perforation, to state the mechanism of its origin which is of importance from a medico-legal standpoint. In the discussion Politzer remarked that the author had forgotten an important symptom which was valuable for differential diagnosis between recent perforations and old ones originating in suppurative processes. In the first, the borders of the wound are covered with blood and by Valsalva's method the air passes easily into the external meatus, while in

pathological perforations the air makes its exit only under greater pressure and produces a whistling sound.

FERRERI: Changes in the Middle-Ear in Old Age.—Ferreri made 201 experiments on aged persons in order to determine whether or no the hardness of hearing, which often accompanies old age, arose from a hyperplastic otitis media or from an involution process. For this purpose he had in addition made an anatomical examination of the temporal bones of two persons aged respectively ninety-two and one hundred and twelve years, and demonstrated that in them the deafness was a consequence of an otitis media hyperplastica which had resulted in a deformation of the stapes, increase in volume of its head and crura, and a bending of the foot-plate. The bone in addition was atrophic. In the majority of the cases in old age we find a condition of gradual diminution of hearing progressing to complete deafness with no, or but slight, changes. (Atrophy of the membrane, ceruminous plugs, sclerosis peritympanica, dryness of the meatus.) As far as the function of the acoustic nerve is concerned, the author presented seven tables giving the results of numerous tuning-fork examinations, the results of which are as follows :

In old age bone-conduction is preferably through the right ear while air-conduction takes place through the left. In 201 individuals only twenty-one were absolutely free from lesions of the labyrinth. It appears that hearing for the watch is better than for whispered speech. Elderly persons with healthy ears are more numerous than those with diseased ones. The conclusions to be drawn from these statements are that the causes of deafness in old age according to their frequency are collections of wax, the hyperplastic form of middle-ear catarrh, the consequence of suppurative inflammation of the middle-ear, chronic suppurative inflammation of the middle-ear, and, finally, the rare lesions of the acoustic nerve. In the discussion GRADENIGO was of the opinion that in old age where examination revealed no lesion there was great probability that an involution process existed as well of the middle ear as of the acoustic epithelium. POLITZER did not agree with Ferreri inasmuch as in accordance with his observations the majority of the cases showed an ossification of the labyrinthine capsule. MASINI denied the existence of an involution process as a cause of the slight hardness of hearing in old age.

BARR: Suppuration of the Middle-Ear and Mastoiditis after a Mastoid Operation During an Epidemic

of Influenza.—A few days prior to the operation the patient had used a nasal douche of a four per cent solution of boric acid. The operation was performed under bromide of ethyl narcosis with Löwenberg's forceps and Gottstein's curette. Following the operation aristol was used. The inflammation of the drum cavity began three days later. That of the mastoid on the following day. The author is of the opinion that during such epidemics the operation is not to be advised.

DELSTANCHE: Fluid Vaseline in the Treatment of Middle-Ear Disease.

The good results published by him of intra-tympanic injections of fluid vaseline had been substantiated by numerous authors. He replied to the objections of Alt, who had understood him to mean that the injections must replace paracentesis of the drum-head. He had only stated that in cases where paracentesis gave but passing results vaseline injections were to be preferred. In opposition to Alt he praised the good results of simple or iodoform vaseline in acute otitis media purulenta, which often had a pronounced abortive action. He injects three or four grammes. The vaseline must be pure, colorless, without odor, and sterilized. The addition of iodoform is only necessary in infectious otitis media. SECRETAN injects only $\frac{1}{8}$ cc of vaseline and saw good results in otitis acuta, less in chronic and sclerotic forms. SUNE Y MOLIST held that large amounts were unnecessary. He injects but six to eight drops. GRANT used the intra-tympanic probe. He was enabled in this way to lessen adhesions and produce marked and rapid improvement. BRIEGER had found Delstanche's method very useful in numerous cases of dry middle-ear catarrh. POLITZER called attention to the fact that in pure sclerosis, where proliferation of bony tissue existed in the labyrinthine capsule, and in stapes ankylosis, etc., all treatment is useless. In chronic catarrh of the tympanum, with adhesions between ossicles and the inner wall of the drum cavity, the injections, according to Delstanche, produced more or less improvement.

MCCAUGHTON-JONES: The Relation of Hypertrophy of the Turbinated Bodies to Hardness of Hearing, with Particular Reference to their Removal.

He had made collective investigations in reference to the question of the influence of turbinated hypertrophy on hearing and the best treatment for the same. The answers conveyed the impression that the English otologists were generally of the opinion

that these hypertrophies very frequently accompanied deafness and tinnitus, and, if not a cause of the deafness, nevertheless increased it and lengthened its duration. Observations of the author gave as a result that in 300 cases of diseases of the ear the turbinates were hypertrophic in but 69, while in the remaining 231 no hypertrophy or other cause of nasal obstruction was present.

As far as treatment was concerned the majority of those questioned believed that the galvano-cautery, as well as cauterizing with chromic or trichlor acetic acid, was to be preferred to the removal of the turbinates. The author concluded that the turbinates should only be removed where the nature and size of the hypertrophy was such that other measures were useless. In discussion DUNDAS GRANT remarked that he did not remove the turbinates to improve the hearing, but to relieve the nasal obstruction.

FIFTH SESSION, WEDNESDAY, SEPTEMBER 25TH, 9.00 A.M.

President: DR. DELSTANCHE.

KIRCHNER: Sarcoma of the Mastoid Process.

The case was one of myelogenous sarcoma occurring in a man forty years of age who many years before had suffered from a suppurative inflammation of the middle ear. In a short time the neoplasm produced a softening of the bone so widespread and to such an extent that in the autopsy the temporal bone was removed *in toto* with the knife. It originated primarily in the cells of the mastoid process and from here extended towards the drum cavity and still farther inward. A few weeks before death the patient complained of pain in the back of the head, and the mastoid process was sensitive to pressure. After opening this bone a tumor the size of a pigeon's egg was found just beneath the cortex, which could be followed with the probe to a depth of 5 cm. As the whole squama was movable the tumor was not removed. Microscopic examination showed the large cells of the bony marrow surrounded by spindle cells.

Discussion.—FERRERI called attention to the fact of having published two cases of epithelioma of the mastoid process and praised the value of capillary puncture for diagnostic purposes. GRADENIGO had observed a sarcoma originating in the periosteum of the mastoid process. The ear was quite sound. BRIEGER,

GELLÉ, and MOURE saw two cases of primary sarcoma of the middle ear where glandular swelling, as well as facial paralysis, occurred very late. The earliest and most prominent symptom was pain. POLITZER had reported a case of sarcoma of the mastoid process which had extended to the drum cavity, perforated the tip of the cochlea, and entered the cranial cavity through the meatus auditorius internus.

SUNE Y MOLIST made some observations on the frequency of osteosarcoma of the mastoid process in Spain which puncture the cerebral cavity, compress the cerebellum, and as symptoms of such compression cause pain in the back of the head, giddiness, and coma.

THOMAS BARR: **The Treatment of Intracranial Abscesses Consequent on Suppurative Inflammation of the Ear.** (Published in full in the last number of these archives, partially read by U. PRITCHARD).

In connection with the paper read by him at the Fourth International Otological Congress the author was of the opinion that good results might be expected from operative procedure in the following cases :

1. Cerebral abscess, particularly of the temporo-sphenoidal lobe.
2. Cerebellar abscess.
3. Epidural abscess.
4. Infectious thrombosis of the sigmoid sinus.

He is also of the opinion that it is necessary in the operation to first open the cavities of the middle ear. The opening of the skull is best made with the dentist's burr, then completed with the chisel. Extradural abscesses may be the forerunners of temporo-sphenoidal abscesses, and if they lie in the vicinity of the sigmoid sinus may produce septic thrombosis of the same, general septicemia or cerebellar abscess. Operative procedure in cases of epidural abscess are particularly successful. During the last seven years thirty-nine cases with thirty-nine cures have been published. In cases of sinus-thrombosis accompanied by septic symptoms the occlusion of the sinus is the first indication for the operator. It is of first importance to prevent further infection. This occlusion is accomplished by tying the jugular in the neck or by opening the sinus, emptying it and tamponing with iodoform gauze (MACEWEN.) If the symptoms point to a cerebro or cerebellar abscess no time is to be lost. The cavity should be emptied

with a canula, a trochar or aspirating needle and disinfected. In the treatment of such cerebral or cerebellar abscesses the cortex above the ear is opened by aid of the trephine, or in cases cerebellar abscess the opening is made back of the sinus. The diagnosis of the mixed forms of cerebral abscess which are complicated with pachy- or lepto-meningitis or with sinus-thrombosis is often extremely difficult. In all cases we shall do well, where severe cerebral symptoms exist in connection with chronic inflammation of the middle ear, not to wait too long but to explore all ways by which an extra- or epi-dural collection or a cerebral or cerebellar abscess might originate.

GRADENIGO : A Contribution to the Intracranial Surgery of the Complications of Otitis.

Although still difficult at the present time the diagnosis of intracranial complications after otitis media may be made in many cases with certainty. These complications are often observed. The author in the last year has seen in sixty-eight cases of mastoiditis these complications occur fourteen times (17.6 per cent.) including five extradural, two cerebral, and three cerebellar abscesses, two cases of meningitis and two of sinus-thrombosis. Eleven cases were operated on with three deaths (two from meningitis and one from cerebellar abscess), and nine recoveries. The diagnosis of meningitis is the most simple. Then that of sinus-thrombosis. The aphasic and amnesic symptoms assist greatly in cases of left sided cerebral abscess. As far as the technique of the operation is concerned the author distinguishes between urgent and non-urgent cases. In the latter it is better to first open the cavities of the ear. In the former, operation on the squamous portion is to be preferred. In cases where severe symptoms indicate the necessity of operation and the necessary data for the diagnosis of an abscess are wanting, the author recommends to first open the mastoid widely and then lay bare the sinus and the cerebral and cerebellar dura. The exploration of the brain may be made with a trocar not exceeding 3 mm in thickness which should not be introduced to a depth exceeding 3 cm. If this exploration results negatively the dura may be incised and the brain penetrated with the knife.

Discussion.—URBAN PRITCHARD expressed the opinion that in small towns where there were no good surgeons the otologist may undertake the operation. He considered it better to always open the skull. In sinus-thrombosis the posterior edge of the

coagulum should be removed sufficiently to reach the blood stream when it should be tamponed. In operating he uses chisel and gouge ; only in the case of a sclerosed mastoid does he prefer the trephine.

BOBONE, in connection with the previous paper, reported the following case which speaks for the possible difficulties in diagnosis : The patient exhibited fever, dizziness, disturbance of equilibrium, pain in the centre of the head, left sided facial paralysis, constipation. No vomiting. Cerebral abscess was diagnosed. The operation was made by a surgeon. The completely sclerosed mastoid was opened and the sinus bared. As the latter was healthy, and no pus found anywhere the operation proceeded no further. The patient died twenty days later. The autopsy revealed diffuse meningitis, left-sided encephalitis and an extradural abscess the size of a pigeon's egg *on the right side*.

POLITZER called attention to the cases where in spite of very pronounced symptoms no abscess is present and to those where the abscess remains latent. He reported one case in which after an operation pronounced improvement took place, followed by death six days later. At the autopsy a second abscess was found posterior to the first.

BRIEGER operated on a case of sinus-thrombosis in which all symptoms disappeared after the operation. In another case accompanied by the same symptoms the operation gave only a temporary result, the patient dying later on. At the autopsy the sinus-thrombosis of the *opposite* side was found. The author considered the prognosis in extradural abscess as absolutely favorable. The results in sinus-thrombosis are probably better than in cerebral abscess ; with reference to treatment he was of the opinion that, though the chiselling upon the skull might favor the emptying of the abscess into the lateral ventricle, nevertheless he preferred the hammer and chisel to the trephine. In reference to the prognosis he observed that even in cases when the operation gave the best results it is not possible to estimate the final outcome with certainty.

GORIS, MORPURGO, CRESSWELL BABER also participated in the discussion.

BENNI.—Report on the Baron Lenwal Prize.—Considering the absence of opposition, the following will be substituted with Baron Lenwal's permission. The interest on the 3000 francs which has accumulated in the interval between two

Congresses will be given to the author of the most marked progress in practical treatment of diseases of the ear, or to the discoverer of a new light and portable apparatus for the improvement of hearing.

HEIMAN.—A Case of Otitic Cerebellar Abscess.—This is the seventh case coming under Heiman's observation. The early symptoms were those of meningitis, high fever, pain in the occiput, nausea; then followed giddiness, retraction of the head, numerous and involuntary evacuations, irregularity of the pupils, slowness of speech; still later, diminution of vision, disturbances of the head, occasional vomiting, hyperesthesia of the skin, loss of memory, ptosis of the right upper eyelid, hemiparesis of the facial (right); at a still later stage, hemiparesis of the left extremities and choked disc. The patient had suffered for some time from right-sided otorrhœa. From these symptoms Heiman diagnosed an abscess of the right cerebellar lobe. In spite of all these data the hospital surgeons believed the abscess to be in the temporo-sphenoidal lobe and operated in this direction, naturally without result. After a time the speaker repeated the operation, following the indications of his diagnosis. The mastoid process was widely opened and the greater portion of the upper and posterior wall of the external meatus was removed. On account of the weakness of the patient further procedure became impossible. In spite of this he improved for a short time, but finally died. At the autopsy four cysts of the size of lentils were found in the gray substance of the temporal lobe. The right lobe of the cerebellum and the vermiform process were filled with green fluid, foul-smelling pus. The wall of the abscess formed a capsule 1 m in thickness. The speaker was of the opinion that in this case diagnosis presented no obscurity. It was based upon occipital pain, vomiting, and the disturbances of co-ordination of the head.

ST. CLAIR THOMPSON.—Antisepsis and Intranasal Treatment.—As the interior of the nasal cavity is practically aseptic, antisepsis is not necessary. The presence of any form of foreign body in the nasal cavity stimulates the secretion of the mucous membrane. It is therefore advisable, with few exceptions, to refrain from any form of antisepsis. With reference to the removal of masses of pus from the nasal cavities, the use of a slight alkaline douche is the best that can be done. Most essential is the thorough disinfection of fingers and instru-

ments. Every instrument may be considered as sufficiently aseptic which has been washed in a five-per-cent. solution of carbolic acid and kept in a case having glass windows. Prior to every operation the instruments should be again washed in the same solution. The art of antiseptics consists in attention to the smallest details.

SIXTH SESSION, WEDNESDAY, SEPTEMBER 25TH, 2 P.M.

President: URBAN PRITCHARD.

Discussion of the address of ST. CLAIR THOMPSON.

In connection with the experiments made by himself in association with LERMOYEZ, HELME stated that their method was practicable and but slightly complicated. Its object was to prevent entrance of pathogenic germs.

GRADENIGO observed that if one operates on an unhealthy nasal mucous membrane, the wound becomes covered with an exudate or a suppurative infiltration. Here energetic antiseptic treatment is not capable of preventing the suppuration and often times general reaction.

BRIEGER and CRESWELL-BABER consider the aseptic treatment of the nasal mucous membrane impossible. They make use of a wash composed of a 7 to 1000 salt solution.

DUNDAS GRANT said that where the nasal mucous membrane is normal, antiseptics is superfluous. In cases where the mucous membrane secretes he applies aristol.

DALY prefers a 1 to 5000 sublimate solution, particularly after operations. He also uses aluminium tubes, which are wound with Brun's cotton dipped in a solution of eucalyptus and benzoin, and introduced into the nose as a tampon.

ST. CLAIR THOMPSON replied that it was absolutely unnecessary to boil instruments, and called attention to the large English clinics where in laparotomies the instruments are treated according to the method above described.

POLITZER.—The Present Status of the Pathological Anatomy of the Labyrinth.

After an historical review of the pathological anatomy from which our knowledge of the pathological anatomy of the labyrinth originates, he proceeded to a discussion of the pathologico-anatomical changes which he divided into three categories: first, hyperemia; second, blood extravasations; and third, primary and

secondary inflammations of the labyrinth. Hyperemia is easily recognized anatomically. The vascular supply of the labyrinth is to-day well known. As a frequent cause of hyperemia are to be considered obstructions to the return of venous blood from the labyrinth to the cranial cavity (*e.g.*, cerebral tumors), and next are disturbances in the action of the sympathetic, and chronic inflammation of the tympanum. Hemorrhages in the labyrinth occur most frequently in infectious diseases and in diseases of the heart and lungs. Circumscribed hemorrhages and larger extravasations of blood have been observed in various portions of the labyrinth. Knapp and the writer have seen such labyrinthine hemorrhages in chronic suppuration of the tympanum complicated with caries. The hemorrhages demonstrated by Moos and Steinbrügge in pachymeningitis hemorrhagica are very interesting. Slightly better known than the previous affections are the inflammations of the labyrinth. The consequences of primary inflammation are but little known and of the initial lesions we know absolutely nothing. The author demonstrated before the International Congress at Mailand the first case of primary inflammation of the labyrinth. Those alterations of the labyrinth occurring in connection with infectious diseases are in general due to an invasion by specific microbes or of pus. Moos was the first who demonstrated this fact, particularly in measles. The alterations of the labyrinth in cerebro-spinal meningitis always occasion particular interest. Heller was the first to demonstrate pus in these cases and at the present time the penetration of pus through the aqueducts of the labyrinth, particularly of the aquæductus cochleæ which is in immediate connection with the cerebro-spinal space, has been completely demonstrated. The changes vary according to the stage of the principal disease. In the early stages suppurative inflammation is more prominent, while in the later stages all the consequences of inflammation appear (atrophy, disturbances of the membranous portions of the acoustic branches, deformation of Corti's organ, fibrous new formation and ossification). The writer then considered the frequency of inflammations of the labyrinth occurring in the course of chronic inflammation of the middle ear which arise from the entrance of pus through the round window or from its being transported through the blood or by way of the lymph spaces. A form of exudation in the labyrinth which is at the present time but little known is caused by an obstruction in the meatus audi-

torus externus producing a compression of the blood vessels. In a case observed by the author (carcinoma), the exudation in the labyrinth consisted of a granular mass lying partly upon the covering of the cochleæ, partly upon the lamina spiralis. The author further considered the changes in leucæmia and in syphilis. In the former they consisted of new formed connective tissue or ossification in the scala tympani and semicircular canals, collections of lymph cells in the interior of the semicircular canals, in the vestibule, etc. In the latter, narrowing of the labyrinth spaces through hyperostosis of the temporal bone, atrophy or destruction of the ganglion cells and of the acoustic fibres, alterations of the blood vessels (Kirchner), thickening of the periotum of the vestibule, fibrous and often calcareous formations (Moos). Primary labyrinthine tuberculosis has not as yet been observed. Of many secondary lesions tissue-necrosis and fibrous formation in the cavities of the labyrinth are most prominent. In conclusion the writer described ossification of the labyrinthine capsule and depression of Reissner's membrane, first observed by Steinbrügge.

MOURE.—Cavernous Angioma of the Ear.—Moure removed the tumor from a woman 47 years of age who complained of headache and hemorrhage from the right ear, with slight discharge. The tumor, which was the size of a bean and non-pulsating, was removed with a cold snare. Immediately following its removal hemorrhage so copious ensued that tamponing the meatus with iodoform gauze became necessary. The point of implantation of the tumor was on the upper and posterior portion of the tympanic cavity. Anatomical examination showed the tumor to be formed by a wall surrounding a closed space. Under the microscope the wall showed itself to be composed of three layers of cells, one layer composed of connective tissue and infiltrated with small nodules and numerous cavities lined with endothelium. The central cavity was in all probability a dilated vessel.

SUNE Y MOLIST.—Some Peculiarities of Gunshot Wounds in the Mastoid Region.—In Spain, where pistols and revolvers are still resorted to on slight provocation, gunshot wounds of the mastoid region are not rare. The results of such wounds are as follows :

1. The bullet causes a comminuted fracture of the bone.
2. It penetrates but a short distance and falls to the floor of the cavity or can be removed with ease.
3. Cerebral or labyrinthine concussion.

SEVENTH SESSION, TUESDAY, SEPTEMBER 26TH, 8 A.M.

President, PROF. KIRCHNER.

MASINI.—The Influence of Lesions of the Ear Upon Respiratory Exchange.—The question was studied by the writer in connection with Polimanti by experiments made upon pigeons. The fowls were kept several days on the same diet (25 grammes of beans) after which they were placed in Fredericq's respiration apparatus where the normal amount of CO_2 expired was estimated. The semicircular canals or the cochlea were then removed. Where the semicircular canals were removed a marked diminution of the amount of CO_2 expired was observed, while in the cases where a lesion of the cochlea had been made the amount remained almost unchanged.

SZENES.—Traumatic Lesions of the Auditory Meatus.

HEIMAN.—Statistics of Ear Diseases.—The basis of Heiman's statistics were the diseases of the ear which he had treated in a military hospital, and such young persons as he was called upon to examine with reference to their suitability for military service. He had studied the four following points :

1. The frequency of diseases of the ear between the ages of twenty-one and twenty-five.
2. The mortality.
3. The frequency of disease in various portions of the ear.
4. The therapeutic results.

As far as the frequency of ear diseases was concerned he found it to be 8.74 per cent. The mortality from diseases of the ear relative to the general mortality of the hospital was 1.78 per cent. Supported by the data so obtained the writer believed, in opposition to other authors, that one can estimate the mortality in diseases of the ear. This varies from $\frac{1}{100}$ to $\frac{1}{10}$ of one per cent. in diseases of the ear in general, and from 2 to 4½ per cent. in cases of inflammation of the middle ear.

GRAZZI.—A case of Complete Deafness following Acute Meningitis due to Fraenkel's Diplococcus.—The patient was a child four years of age who remained completely deaf and dumb after a severe meningitis. The bacteriological examination made in the pædiatric clinic showed the pathogenic agent to have been Fraenkel's diplococcus. GRADENIGO was of the opinion that this case presented a highly interesting point of view as unsettling the question of primary labyrinthitis as understood by Volto-

lini. In an epidemic of cerebro-spinal meningitis Gradenigro often saw these forms of deafness accompanied by symptoms of fever.

BRIEGER remarked in addition that the casual connection between meningitis and the finding of pneumococci has not been demonstrated, as Fraenkel's diplococcus belongs to those bacteria which inhabit the healthy nose.

D'AGUANNO.—**On the Etiology of Paracusis Willisii.**—The writer reported a case in which the cause of the paracusis was to be sought for in the drum cavity and chain of bones. In fact the functional examination demonstrated that the acoustic nerve was perfectly intact, while chronic catarrh of the tympanum and diminished mobility of the ossicles were present.

VERDOS.—**The Disturbances of the Ear Occasioned by Explosions of Dynamite.**—The anarchist riot in the theatre at Barcelona in 1893 gave the writer an opportunity to study the disturbances of the ear produced by explosions of dynamite. They manifested themselves differently according to the distance of the persons during the explosions, being located in the external and middle ear in persons near the explosion and more in the inner ear in persons distant from it.

LUBET-BARBON.—**Localized Inflammations of the Temporal Bone and their Relations to its Anatomical Development.**—The writer reviewed the mode of development of the temporal bone, and called attention to the presence in adults in 5 per cent. of the cases of the fissure mastoidea squamosa as demonstrated by Kirchner, and to the frequency with which one observed the point of union of the os tympanale with the squamous portion and the mastoid process, and observed, in addition, that very often in cases of otitis of the temporal bone the inflammation remains localized in one of the parts which in the fetus are separate. In this way the writer explains some facts which by others are considered in a different way. The connection between exfoliation of the os tympanale and hereditary syphilis, maintained by Hagermann, did not exist for him. The os tympanale is a bone which may be destroyed, and like other bones be dissolved. In inflammation in adults all parts of the bone must be considered as a whole, and this is so much the more correct in that primary and isolated inflammations affect not solely the mastoid process, but the squamous portion and the tympanic portion as well. In mastoiditis the symptoms develop below the linea temporalis. In

ostitis of the squamous portion, on the contrary, the mastoid process is in the beginning neither red nor painful, while swelling and pain exist above the insertion of the auricle. Oftentimes the inflammation attacks that part of the squamous portion which forms the upper wall of the external meatus, and these are the cases where Stacke's operation is indicated. More rarely an isolated inflammation of the os tympanale occurs, though the writer believes that many of the concentric enostoses of the meatus are to be attributed to an ostitis of this bone.

SECCHI.—The Physiology of the Middle Ear.—The writer expressed the opinion that the mechanism of the ossicles of the ear formulated by Helmholtz is not free from criticism. He made experiments in the laboratory in Bologna on cats and dogs in the following manner: Tracheotomy was made and a canula placed in the upper portion of the trachea. The bulla auricularis was then laid bare, opened, and a canula inserted, to which was connected an alcohol manometer. The experiments gave the following results: The air in the drum cavity has a pressure of about 3 *mm* of alcohol higher than that of the external air. This pressure usually occasioned by swallowing may also be a consequence of activity of the muscles of the drum cavity. The intratympanic pressure rises with every sound which calls the attention of the animal; remains unchanged, however, to sounds to which the animal is accustomed. If a series of successively more intense sounds are exhibited, the manometer reacts with many respective elevations. This increase of pressure demonstrated by the influence of sound also occurs if pressure in the cavity is negative. The vowels, *a*, *e*, *i*, *o*, and *u*, increase the pressure. In one case where tenotomy of the tensor tympani was successfully made, the intratympanic pressure decreased under the action of acute and intense sounds. The author declared himself inclined, therefore, to assume that the sound-waves were not conveyed through the ossicles, but rather through the air in the drum cavity, and through the cochlea from the drum head to the membrane of the round window, in keeping with Pascal's theory.

The demonstration of the experiments which were made by the writer gave brilliant results.

MONGARDI called attention to Müller's experiments, which indicate conduction through the ossicles.

GELLÉ could not believe that it was necessary, from the very

beautiful experiments of Secchi, to assume a transmission of the sound-waves through the round window, as he found it difficult to conceive a conduction of tones against the scala tympanica, which was devoid of sense organs while the footplate of the stirrup is in immediate connection with the latter. The round window can only possess a secondary function.

Demonstrations: CHIACINI demonstrated a new method of making anatomical sections of the temporal bone. POLITZER demonstrated microscopic and macroscopic preparations showing the various methods and stages of operative treatment of chronic suppuration of the middle ear. CRESWELL-BABER exhibited instruments.

EIGHTH SESSION—SEPTEMBER 26, 2 P.M.

President, DR. MORPURGO.

Demonstration of instruments (Delstanche).

BRONNER.—Local Massage in the Treatment of Chronic Eczema of the External Ear.

GARZIA.—The Importance of Syphilis in certain Diseases of the Ear.—The writer called the attention of the Society to the fact that syphilis may be the essential cause of the long duration of certain suppurative inflammations of the middle ear. This cause consisted in the fact that the foundation of the suppuration was a carious spot of bone, and that this carious process was caused by syphilis. In such cases specific treatment had given very brilliant results. The writer had observed seven such cases, five of which were due to acquired, and two to hereditary syphilis. In the former the disease had extended from the naso-pharynx.

GARZIA.—Pediculated Exostosis of the Meatus.—The tumor closed the meatus completely. The point of attachment was the anterior side. One-half of the tumor was removed by aid of Burnett's forceps, the remainder with the chisel. The meatus and drum head were scraped out, they being covered by a thick layer of flat epithelium.

This finished the business of the day. On account of lack of time the following articles were not read:

MADEUF. — Medico-veterinary Investigations on Diseases of the Ear in Mammals.

A. LEVY, Copenhagen.—A New Instrument for the Treatment of Acute and Chronic Diseases of the Middle Ear.

S. OTTOLONGHI, Sienna.—The Accountability of Deaf Mutes and the Laws.

COZZOLINO.—Pathological and Bacteriological Examinations of the Nose, Pharynx, and Cavities of the Middle Ear in Infants and New-born Children.—A new method of opening the antrum and mastoid cells.

SOFFIANTINI.—Intramuscular Injections of Calomel in Otology, Rhinology, and Laryngology.

STOKER.—An Operation for Intracranial Abscess.

CARMALT-JONES.—Removal of the Turbinates for Tinnitus Aurium.

With universal approval London was chosen as the place for the session of the Sixth International Otological Congress, to take place in 1899.

REPORT ON THE PROGRESS OF OTOTOLOGY DURING THE THIRD QUARTER OF THE YEAR 1895.

Translated by Dr. WARD A. HOLDEN, New York.

I.—ANATOMY, HISTOLOGY, AND PHYSIOLOGY OF THE NOSE AND NASO-PHARYNX.

By PROF. A. BARTH, Breslau.

A.—ANATOMY.

a.—EAR.

195. TOMKA. Upon anomalies of development of the stapes. *Arch. f. Ohrenh.*, xxxviii., p. 253.

196. DUNN, JOHN. A case of spontaneous dehiscence of the wall of the superior semicircular canal. *ARCH. OF OTOL.*, April, 1895.

196. After removing the brain of a negro, aged about thirty-five, DUNN found a large irregular dehiscence in the right temporal bone, showing several large air-spaces at the petro-squamous junction. Interior to these cells were twenty or twenty-five small dehiscences in the tegmen antri and the tegmen tympani. There was also a transverse dehiscence, 5 mm long, of the whole of the bony wall of the superior semicircular canal, so that the ridge of bone usually marking the position of this canal was much reduced in size. The outer layer of the dura mater served as the superior wall of the superior canal.

There was also a large dehiscence over the semicircular ganglion and over the upper covering of the carotid artery. The left temporal bone showed almost the same conditions.

GORHAM BACON.

b.—NASO-PHARYNX.

197. HOPMANN. Anomalies of the choanæ and naso-pharynx. *Arch. f. Laryngol. u. Rhinol.*, iii., p. 48, 1895.

197. By means of his method of preparing plastic impressions of the choanæ and pharynx HOPMANN proves that the narrowing and other irregularities of the choanæ and upper pharynx are due not only to syphilis and ulcerations, but also to malposition of the parts from congenital or acquired disturbances in development.

B.—PHYSIOLOGY.

a.—EAR.

198. P. BONNIER. Relations between the ampullary apparatus of the internal ear and the oculo-motor centres. *Comptes rend. de la Soc. de Biol.*, Series X, t. ii., No. 6, p. 368.

199. CRUM-BROWN. The relation between the movements of the eyes and movements of the head. *Lancet*, May 28, 1895.

200. BLOCH. On binaural hearing. *ARCHIVES OF OTOTOLOGY*, April, 1895.

199. In an interesting paper read before the Oxford University Junior Scientific Club, CRUM-BROWN discussed the function of the utricle and semicircular canals, as a special sense of rotation in reference to the cause of compensatory movements of the eyeballs in movements of the head, and drew attention to the fact that deaf-mutes, who, besides having some defect of the internal ear, are in a large proportion defective in the sense of rotation, as shown by the absence of the normal jerking of the eyeballs when they are rotated, and by a perceptible insecurity in their gait.

URBAN PRITCHARD.

200. BLOCH gives the results of experiments made upon himself in regard to the increase in tone-sensation with binaural conduction, as to the direction of sound, and as to the judgment of the distance of the source of sound. He concludes his paper by giving the characteristics of binaural hearing.

GORHAM BACON.

b.—NASO-PHARYNX.

201. ZWAARDEMAKER. The physiology of smell. Leipzig (W. Engelmann), 1895.

202. KAYSER. The exact measurement of the permeability of the nose. *Arch. f. Laryng. u. Rhinol.*, vol. 3, p. 101, 1895.

202. KAYSER has made verifying experiments on Zwaardemaker's investigations, by introducing tubes into the nose which can be obstructed to any degree desired. No practical conclusions can be drawn from his results.

II.—PATHOLOGY AND THERAPEUTICS.

By DR. ARTHUR HARTMANN, BERLIN.

MISCELLANEOUS.

203. DANZIGER, F. Contribution to the questions of the history and etiology of cancer of the ear. *Monats f. Ohrenheilk.*, No. 7, 1895.

204. BRUCK. Upon a neurosis of the maxillary articulation having a course like that of a disease of the ear. *Deutsche med. Wochenschr.*, No. 33, 1895.

205. GOLDFLAM, S., and MEYERSON, S. Upon objectively perceptible noises in the ear and head. *Wien. med. Presse*, Nos. 17, 18, 1895.

206. CAPEDE, C. J. Upon cases of diplacusis binauralis. Dissert. Bâle, 1895.

207. SPIRIG, W. Upon a unilateral, objectively audible noise emanating from the ear in a case of aortic insufficiency. *Correspondenz f. Schweizer Aerzte*, No. 8, 1895.

208. EITELBERG, A. Upon aural affections in blood-relations. *Wien. med. Wochenschr.*, Nos. 20 and 21, 1895.

209. BLISS, A. A. A contribution to the study of deaf-mutism. *Med. News*, Aug. 10, 1895.

203. DANZIGER's patient, a woman of fifty-four, who has suffered from otorrhœa from her tenth year, had a whitish-red tumor apparently springing from the posterior wall of the canal. On attempting to remove it, it was found to fill the tympanic cavity whose walls were carious. The growth was a pavement-celled epithelioma. According to the author, epithelioma of the tympanic cavity only develops after chronic otorrhœa. KILLIAN.

204. In Bagnisky's clinic five cases were observed of neuralgia of the articulation of the lower jaw that BRUCK placed in the category of Esmarch's joint neuroses. The patients were led by the severe pain to believe that they were suffering from ear disease, which was not the case. The internal use of arsenic led to rapid improvement. NOLTENIUS.

205. The first case of objectively perceptible noises in the ear reported by GOLDFLAM and MEYERSONH was muscular and due to contraction of the tensor palati, a rythmic contraction of the soft palate with elevation of the uvula accompanying each sound, which the patient could stop by pressure with the finger.

The second was one of sounds heard on the skull, that were synchronous with the pulse and were accompanied by symptoms of brain pressure.

Compression of the left common carotid stopped the sound and caused no cerebral symptoms. The artery was therefore ligatured, but the sounds returned four hours later. The patient died some weeks later, but no autopsy was obtained.

In conclusion the author reports a rare case of perception of a venous bruit in the ear, that could be heard objectively with the stethoscope.

POLLAK.

207. In cases of aortic insufficiency it is well known that sound can also be heard over smaller arteries. In SPIRIG's case an intermittent, weak, blowing sound synchronous with the pulse was heard through the otoscope. No sound was audible on the mastoid process or at the vertex, but one was heard over the right carotid, subclavian, and brachial arteries.

208. By a material consisting of 262 individuals which were grouped according to relationship, EITELBERG shows the effect of heredity not only upon chronic nasal, pharyngeal and aural catarrh, but also upon purulent inflammations of the middle ear.

POLLAK.

209. BLISS examined 546 pupils, and says that "the lessons to be learned from these statistics and those of other observers bear relation mainly to the prevention of deafness in infancy and early childhood. We have seen that, excluding the unfortunate victims of inherited weakness and disease, to whom the congenital deaf-mutes probably belong as a class, we have large groups of individuals whose total deafness (and resulting mutism) has developed at an early age, and was apparently of such nature in the beginning as to have allowed of cure had the aural conditions been recognized in time and treated judiciously. GORHAM BACON.

INSTRUMENTS, METHODS OF EXAMINATION, AND TREATMENT.

210. BISHOP, S. S. The dilator in diseases of the air passages and the ear. *North Amer. Practitioner*, July, 1895.

211. CASSELBERRY, W. E. Electrolysis by a current controller for the reduction of spurs of the nasal septum. *N. Y. Med. Fourn.*, Aug. 3, 1895.

212. SCHEPPEGRELL, W. A new and simple method by which cautery irons may be electrically heated almost instantaneously. *Med. News*, Aug. 10, 1895.

213. DEES, W. W. A self-retaining nasal speculum. *N. Y. Med. Record*, July 27, 1895.

214. VEEDER, A. T. An air pump and nasal inflator. *N. Y. Med. Fourn.*, July 20, 1895.

215. BRANDAGEE, W. P. A new adenoid forceps. *N. Y. Med. Record*, Aug. 3, 1895.

216. BORS, LOUIS. A new mouth gag. *N. Y. Med. Fourn.*, July 21, 1895.

217. FREUDENTHAL. Electro-vibratory massage of the ear, nose, and throat. *Ibid.*, Sept. 28, 1895.

218. BISHOP uses a dilator in treating ear diseases by which vapor (being not properly a spray but so fine that it resembles a fine cloud) is produced under high pressure and may be impregnated with either volatile or non-volatile medicaments. With the dilator, the writer medicates the tympanic cavity with a ten per cent. solution of camphor-menthol in lanoline—without unpleasant results. The nozzle of the dilator is fitted into one nostril while the other is held tightly closed as in Politzeration. The cheeks are fully distended with air and the current is turned on from the compressed air reservoir. The current is repeatedly interrupted by the cut-off so as to alternately fill the middle-ear with the vapor and allow it to escape. This with the pneumatic otoscope, Bishop finds of great value in the treatment of dry catarrh of the middle ear.

GORHAM BACON.

219. CASSELBERRY does not intend to substitute electrolysis for the surgical method of removing excrescences or spurs of the nasal septum, with the knife, saw or drill, but to determine its exact limitations. He adopts the Edison electric light circuit for this purpose by means of lamp resistance and the McIntosh current controller. The latter is composed of resistance coils arranged in two rows, with sliding contacts to each. The coils on the left divide the electro-motive force into tenths, the contacts forming the decimal slide, while those on the right divide it into hundredths, these contacts forming the centesimal slide, which

add a fraction to the former. In order to reduce the initial circuit of the decimal division, a series of lamps representing a current of sixteen candle power is placed in the current, which reduce the original electro-motive force from 110 to 55 volts. The required amount of from 15 to 40 milliampères can thus be easily obtained. Casselberry uses the bi-polar method exclusively by means of two parallel needles of from 15 to 20 mm in length, about $\frac{1}{2}$ mm in thickness, which are about 3 mm distant from one another, are made of irido-platinum and placed into a handle like those used for galvano-cautery. He has treated ten cases, classed them into three types, *viz.*, I., the strictly cartilaginous spurs, II., the mixed cartilaginous and bony spurs, and III., the bony spurs. Type I. can be thoroughly removed by electrolysis at from one to three sittings, but the surgical method is far superior; Type II. is also better treated surgically; Type III. cannot be treated by electrolysis for electrolysis does not remove bone. It is powerless also in the correction of deviated septa, but it is a valuable addition on account of the absence of hemorrhage, the efficiency and convenience of its application, especially in cases in which surgical interference is declined.

M. TOEPLITZ.

212. A metal when dipped into a jar containing a watery solution of borax and sodium carbonate, becomes red hot after a few seconds and even melts, if held there longer. The jar is connected with the terminal of a 230-volt Edison current, the positive wire being attached to lead at the bottom, the negative one passing across the top. The metal to be heated is connected with the negative wire. This method, first seen by CASSELBERRY at the World's Fair at Chicago, was found very useful in arresting an alarming hemorrhage after tonsillotomy, which the Pacquelin had failed to control.

M. TOEPLITZ.

213. To the back of the spring of a speculum (Bosworth's), controlled by a set screw, a slotted nib is welded, which is hinged adjustably to a bar, for its use on either side, and runs to a ball and socket-joint at the head-piece of a forehead mirror worn by the patient.

M. TOEPLITZ.

214. VEEDER has devised rubber bags to be connected with an air-pump for inflation, which are inserted into the nostril and cut off after inflation and ligation. He has designed three forms with or without breathing tube in the centre and uses them after operations for straightening the septum and for controlling intranasal hemorrhages.

M. TOEPLITZ.

215. BRANDEGEE'S instrument is an avulsion and cutting forceps. The cutting blades do not cross, so as to leave a space for the uvula. It can be taken apart and rendered aseptic.

M. TOEPLITZ.

216. The instrument is composed (a) of two steel plates, like those in the Denhard mouth gag, for fixation of the teeth; (b) two connecting rods with two round plates, by which, when pressed upon, the mouth is opened; (c) a spiral spring between the two plates around the upright, thicker rod. If the gag is used on the other side it has to be turned over. Boos claims for his gag the following advantages: It can be easily inserted and well controlled by the operator; it is self-retaining and can be taken apart. The instrument is made by Tiemann & Co.

M. TOEPLITZ.

217. FREUDENTHAL'S instrument has been described in vol. XXIII., p. 357, of THESE ARCHIVES. An attachment for the exercise of pressure upon the membrana tympani is added.

M. TOEPLITZ.

EXTERNAL EAR.

218. VOSS. On foreign bodies in the ear and the results of attempts at extraction. *Arch. f. Ohrenheilk. Petersburg med. Wochenschr.*, No. 23, 1895.

219. DUNN, JOHN. A note on the treatment of otitis externa circumscripta with salicylic acid collodion. THESE ARCHIVES, April, 1895.

218. Voss reports a case of death caused by awkward attempts to remove a foreign body from the external canal. A girl of five had pushed the kernel of a carob bean into the ear and four physicians had endeavored to extract it. When examined in narcosis the foreign body was found to be driven into the tympanic cavity, and there was a sanguinolent exudation. Temperature, 39°. After detaching the auricle and widening the canal the foreign body was readily removed. Half of the drum membrane was destroyed and the malleus fractured. After the operation the child became somnolent and comatose, convulsions came on, and death followed in two days.

219. DUNN recommends the following to be applied in cases of furuncular inflammation of the external meatus:

Rp. Acid salicylic, 3 i.
Collodion, 3 i.

GORHAM BACON.

MIDDLE EAR.

220. BACON, GORHAM. A case of cerebellar abscess as a result of chronic suppurative otitis media. Operation; death; autopsy. *Amer. Fourn. Med. Sciences*, Aug., 1895.
221. BARKAN, A. Abscess of the brain following suppurative otitis media. *Occidental Med. Times*, June, 1895.
222. HOOVER, PIERCE. Tincture of iodine in otitis suppurative chronica. *N. Y. Polyclinic*, Aug., 1895.
223. BUCK, A. H. Comparatively painless mastoid disease. *N. Y. Med. Record*, July 20, 1895.
224. ABBE, ROBERT. Sinus pyæmia and jugular thrombosis. *N. Y. Med. Record*, July 27, 1895.
225. BURNETT, C. H. The prevention of mastoid empyema. *Med. News*, Aug. 17, 1896.
226. CHEATHAM, W. A case of otitic abscess in a diabetic with a fatal result. *Cincinnati Lancet-Clinic*, Aug. 10, 1895.
227. RANDALL, B. ALEX. Pneumatic massage by the finger tip in catarrhal deafness. *Philadelphia Polyclinic*, Sept. 28, 1895.
228. BANE, WM. C. Inflammation of the middle ear with involvement of the mastoid. Report of cases. *Denver Med. Times*, Aug., 1893.
229. PITTS, BERNARD. A case of otorrhœa, lateral-sinus thrombosis; operation; recovery. *London Lancet*, Aug. 10, 1895.
230. KNAPP, H. History and autopsy of two cases of fatal otitic brain disease. *ARCHIVES OF OTOL.*, April, 1895.
231. VULPIUS. Three cases of influenza-otitis with epidural abscess. *Ibid.*
232. CLEVELAND, A. H. Right suppurative otitis media; extensive thrombosis, beginning in right petro-squamous sinus; left cerebellar abscess. *Ibid.*
233. HERZOG, M. A Stacke mastoid operation, followed by an epileptic attack. *Ibid.*
234. DENNIS, D. N. Cases of empyema of the frontal and ethmoidal sinuses, causing orbital tumors. *Ibid.*
235. MARCHAND. Mastoiditis, complicating otitis. *Soc. de Chirurg.*, 26, xii.

236. GRADENIGO. On the operative treatment of chronic purulent otitis media. *Allgem. Wiener med. Zeitung*, Nos. 39 and 40, 1895.

237. OPPENHEIM. On the character of the aphasia with otitic abscess of the left temporal lobe. *Fortschr. der Med.*, No. 18, 1895.

238. BERGMANN. On some advances in brain surgery. *Report of the German Surgical Society*, 1895.

239. SPIRA. On sinus-thrombosis and pyæmia, following otitic media purulenta. *Wiener klin. Rundschau*, Nos. 30-33, 1895.

240. VOSS. A contribution to the operative treatment of sinus-thrombosis. *Arch. f. Ohrenheilk.*, xxxix., p. 184.

220. BACON's patient, an Irishman, aged thirty-one, was first seen November 23, 1894. He had had chronic purulent otitis media on the right side for five years previously. The drumhead was entirely destroyed, and granulations were formed at the entrance to the attic. There was no pain nor tenderness over the mastoid.

December 11th, the patient was admitted to the Infirmary. Six days before this, he commenced to have nausea, vomiting, and vertigo, which had persisted up to the present time, the discharge being less in quantity. There was also a staggering gait. Bone conduction almost lost.

It being impossible to have proper drainage from the attic, the mastoid was opened with chisels down to the antrum, and the latter was found filled with granulations, which were removed. The mastoid was very dense and as hard as ivory. Free drainage was established. There was at first a slight improvement, but three days later the patient had a severe attack of vomiting, and he soon began to complain of a severe pain on the top of his head—symptoms of right facial paralysis developed.

A diagnosis of cerebellar abscess was made on December 24th, on account of the following symptoms, viz., slight œdema of the right optic nerve, severe headache, vomiting, intense vertigo on motion, a staggering gait, facial paralysis, slow pulse, and temperature but slightly above normal.

December 25th. The patient was etherized, the previous mastoid opening was enlarged, and the lateral sinus exposed. The latter was found normal. A disc of bone 2 cm in diameter was

then removed at a point 5 *cm* behind and 6 *mm* below the centre of the external and meatus.

Different portions of the cerebellum were explored, but no pus was found. A disc of bone was then removed at a point 5 *cm* directly above the centre of the external meatus, and the brain explored, as well as the tympanic cavity, but as before with a negative result.

For the first few days after the operation, there was less headache, dizziness, and vomiting, and the facial paralysis was less marked ; but subsequently the headache became severe again, and the vomiting returned.

The patient gradually failed, and died January 15th, three weeks after the operation.

At the autopsy, the vessels of the pons and medulla were found very much distended. The right lateral lobe of the cerebellum was enlarged, and there was softening of the anterior external two thirds of the right lobe. On division of the right cerebellar hemisphere in the horizontal plane, an abscess containing thick, fetid pus was found within the hemisphere in its anterior part, measuring 4.5 *cm* antero-posteriorly, and 3 *cm* transversely. The cavity of the abscess was surrounded by a wall 3 *mm* in thickness. The abscess obliterated entirely the corpus dentatum and its interior limit encroached upon the middle cerebellar peduncle. The third and eighth nerves had undoubtedly been compressed by its inner portion. There was no evidence of meningitis over the surface of the cerebellum or anywhere else, so that the operation had been practically without harm to the patient.

The autopsy showed that the pus was so thick that it could not have been removed by even a large trocar and canula ; and the only relief that could have been afforded would have been by an enormous incision into the cerebellum and by dissecting out the wall of the abscess. This would have been almost absolutely impossible.

GORHAM BACON.

221. BARKAN's patient, aged thirteen, never had an earache before present attack. She had pain in the left ear on November 1, 1894, for which simple remedies were applied, and the pain ceased for a couple of days, but soon recommenced. On November 4th she had a sore throat, and the ear began to discharge, the pus being very copious, greenish-yellow in color, and free from odor. She had no pain at this time. On November 10th, she again complained of headache and dizziness, and about two

weeks later, there being some tenderness but no swelling or redness of the skin over the mastoid, leeches were applied, and followed by ice-bags.

On November 23d, the temperature varied from 98.5° to 102° F., and at 2 A.M. she suddenly had severe pain in the head, and later was in a stupor. The pulse was regular and good, and the discharge less in quantity. There was pain on pressure over the mastoid. The mastoid was immediately opened, and found completely eburnated. During the afternoon, the patient was quite conscious and had no pain, but during the night the pain returned and the temperature rose to 101° F. There was no optic neuritis. She finally became wildly delirious, with head bent back, and the temperature rose to 102° F. She died on the following day.

Autopsy.—Membranes of brain but slightly congested. In the lymph spaces following the vessels of the pia mater there was more or less pus. There was considerable pus in the lymph spaces on the surface of the cerebellum. The under surface of the temporo-sphenoidal lobe, lying immediately over the petrous portion of the temporal bone, was softened and broken down, forming an abscess about the size of a hen's egg. The dura was but slightly congested, and was thickened over an area of about a quarter of an inch in diameter. The bone showed no perforation.

GORHAM BACON.

222. In obstinate cases that have resisted the usual treatment, HOOVER applies with cotton on the end of an applicator or probe, tincture of iodine, which is to be pushed through the ruptured drum membrane. If small, the perforation should be enlarged. This application should be performed two or three times per week. After making application, a piece of cotton should be pressed against the membrane. The writer claims to have had excellent results from this plan of treatment, and reports four cases in which the discharge ceased after using the iodine.

GORHAM BACON.

223. During the early part of this year BUCK has encountered a few cases in which the symptom pain has occupied a markedly subordinate position. He reports four cases, all of them of an acute type and all characterized by pain at the onset, that is when the inflammation was mostly confined to the tympanum. After this initial period, which lasted from a few hours to two or three days, there was either no pain at all as in Cases II. and III., or the pain was of such a migratory character and so little pro-

nounced in Case I., as scarcely to attract the attending physician's attention to the ear as its starting point ; or finally, as in Case IV., this symptom only developed when some special exciting cause like violent physical exercise was brought into play as a means of calling it forth.

Buck's explanation is that possibly among the various living organisms which, in suitably constructed mastoid processes, produce serious inflammation and ultimately destruction of the tissues involved, there may be one or more species that create toxins possessing a decidedly anæsthetizing power over sentient nerve fibrils. As a proof of the reasonableness of such a belief, he refers to the painlessness of tubercular inflammations of the middle ear. He sums up as follows :

First, serious disease of the mastoid process may coexist with an insignificant amount of pain in the affected region ; and second, of all the physical evidences of disease in this part of the temporal bone the one that is most rarely lacking is a prolapsed condition of the skin lining the upper and posterior wall of the external auditory canal, in close proximity to the membrana tympani.

GORHAM BACON.

224. ABBE read the histories of four cases as follows :

CASE 1.—Sinus pyæmia and jugular thrombosis ; Ballance's operation ; recovery.—The patient, a nurse, aged thirty-two, two weeks before the operation had an acute purulent nasal discharge for which she was treated. This continued for ten days and was improved, though she had an earache with continued headache. There occurred, however, spontaneous perforation of the drum-head, with discharge of pus from the left ear. A few hours later she had a violent chill, with a temperature of 105° F. There was no pain, tenderness, or œdema over the mastoid. Her temperature ranged from 104° to 105° F. for three days. Chills were followed by delirium and the headache continued. She became semi-comatose, and the respirations were shallow and the pulse thready, 120. There was great tenderness over the jugular vein. The common jugular was tied between two ligatures and cut across. The mastoid process was opened, but no pus was found. The lateral sinus was incised in its full extent, and the upper jugular vein also incised. Free irrigation through the incised veins was carried out. The patient recovered.

CASE 2.—Sinus pyæmia and jugular thrombosis ; Ballance's operation ; death.—The patient was a young woman aged twenty,

who had had a suppurative otitis for a year. Two weeks previously she had symptoms of mastoid abscess. The bone was opened and a small amount of pus evacuated. She subsequently had a chill with a temperature of $102\frac{1}{2}^{\circ}$ F., and head symptoms. At the time of the operation the pupils were even, choked disc, mental lethargy, pulse slow, no external swelling or tenderness on percussion. A disc of bone $1\frac{1}{4}$ inches behind and $1\frac{1}{4}$ inches above the meatus was removed. The brain was punctured for abscess, but none was found. The mastoid cells and lateral sinus were then investigated, and the latter contained a putrid clot. This was cleared out and the jugular vein tied and washed out. The patient died, and the autopsy showed a limited purulent meningitis covering the right half of the cerebellum, near the end of the diseased lateral sinus, where an opening had perforated from the mastoid cells and communicated also with the lateral sinus.

CASE 3.—Sinus pyæmia with jugular thrombosis; Ballance's operation; septic pneumonia; death on the fifth day.—The patient, a man aged forty-three, had the grippe, followed by an otitis media with perforated membrana tympani and mastoid disease. The mastoid was trephined, but only temporary relief followed. Two weeks later he had a chill, with fever and sweating; slight swelling and great tenderness developed along the front of the sterno-mastoid muscle. The mastoid was opened again and the sinus laid bare. Purulent fluid was withdrawn. The jugular vein was opened at the junction of the facial, and both ligated and the jugular cut above the ligature. The lateral sinus was opened and a thrombus and pus removed, and the wound treated as in the other cases. He died five days later, with a temperature of from 103° to 105° F.

CASE 4.—Mastoid pyæmia, death from septic pneumonia.—Patient, male, aged thirty-seven, developed a grave septic condition from suppurative otitis. The urine contained albumen and casts. The mastoid was trephined, and offensive pus and foul necrosed bone removed from the attic and middle ear. The jugular vein was examined and pure blood was withdrawn, but it was not laid open. The patient had occasional chills, with evidence of pleuro-pneumonia. The lung symptoms increased and he died on the seventh day after the operation.

GORHAM BACON.

225. BURNETT considers that mastoid disease is largely the

result of unskilful treatment on the part of the physician. If dry heat gives no relief to pain, then the only other proper thing to do in acute otitis media is to incise the membrane. Then the canal should be antiseptically drained by means of a strip of iodoform gauze in the auditory canal. Mastoid trepanation alone, he says, does not check chronic otorrhœa. The necrotic tympanic tissues must be removed before the chronic purulency is checked.

GORHAM BACON.

226. CHEATHAM's patient, aged fifty-six, was first seen Feb. 22, 1895. Pain began that morning in the ear, and there was slight congestion of the drumhead, but no bulging nor any tenderness over the mastoid. Leeches were applied and the ear douched with hot carbolyzed water. The following day it became necessary to puncture the drumhead, when considerable pus escaped. The patient, however, became very delirious and unconscious. The urine contained albumen and casts. The ice cap and cold coil were applied. At three P. M. the same day the temperature was 102° F., pulse 130, and respiration 44. At 9.30 it was decided to trephine for pus. The mastoid was opened, but none was found. There was, however, an old sinus leading from the apex of the bone into the cells. The cranium was opened, but no pus was found in the sinus nor in different portions of the brain. He died forty-eight hours after he first had pain, and two hours before death there was a sudden gush of a black, granular looking semi-fluid from his nose, about a pint in quantity. It proved to be blood and pus. The patient had had mastoid disease about fifteen years before. He was a sufferer from diabetes, although during his illness the sugar disappeared from the urine. He was a champagne drinker.

GORHAM BACON.

227. For the tragus pressure of Hommel, RANDALL substitutes another method as follows: He teaches the patient to place the palmar surface of his middle finger upon the tragus, reaching so far back that when the tragus is drawn strongly forward the finger can just be slipped into the meatus without having the nail scratch the back margin. In this way a considerable suction is obtained.

GORHAM BACON.

228. BANE reports five cases, the first one being a patient who had chronic purulent otitis media with perforation in the upper posterior quadrant of the right drumhead, with implication of the mastoid cells. He disappeared from observation, but in two months' time returned. Below the right ear was a swelling the

size of a goose egg. From the mastoid downward and backward the tissues were swollen and boggy; the posterior auricular glands were indurated and very much enlarged. At the operation, when the mastoid cells were opened, the disease was found to have extended through the under surface of the mastoid into the tissues of the neck. The abscess was opened.

The second case was one of acute purulent otitis media, followed by inflammation of the mastoid cells, in which it was necessary to remove the entire cortex. The mastoid was filled with pus, granular tissue, and carious bone.

The third case was one of acute otitis media, with perforation in the Shrapnell's membrane. Pain and tenderness over the mastoid developed, and it became necessary to trephine the same. The latter did not contain pus, but the cells were engorged.

The fourth case was a patient aged thirteen, who had acute otitis media with tenderness over the mastoid. This case recovered without operation.

The fifth case was one of acute otitis media with mastoiditis. The patient, male, aged forty-one, had pain in the right ear, mastoid, and side of head. Leeches and ice were ineffectual, so that later the mastoid cells were opened, and they were found engorged and broken down. The patients all made good recoveries. The author believes that "with a thorough knowledge of the anatomy of the mastoid and adjacent parts, the operation can be done antiseptically without fear of bad results."

GORHAM BACON.

229. In PITT'S case there was no tenderness along the course of the internal jugular vein. Internal strabismus was noticed on the affected side, with blurring of the disc and enlargement and tortuosity of the retinal vessels. After ligation of the vein, recovery was slow and broken by rigors on four occasions.

230. KNAPP'S first case was one representing a typical abscess in the temporo-sphenoidal lobe, caused by chronic suppuration of the middle ear and ending fatally from cerebral pressure due to a large abscess without further complications. The second was a most unusual case: The patient, aged twenty-four, had an acute purulent otitis media of the left ear with mastoid inflammation. The cells were opened and a small amount of pus evacuated. A disc of bone was removed from the squama of the temporal bone and the brain examined, but no abnormality was

found. At the autopsy, on removing the temporal bone, the upper part of the tympanic cavity was full of pus which collected along the dilated semicanalis pro tensore tympani in the tissues surrounding the tube and formed a prominence in the upper pharyngeal cavity, an otitic retro-pharyngeal abscess connecting with the middle ear.

GORHAM BACON.

231. In all three cases, during or after an attack of influenza, a purulent otitis media with violent symptoms developed, assuming a more subacute character in the course of a few weeks. The drainage of the tympanic cavity not being sufficient, the inflammation and suppuration invaded the mastoid cells and the posterior cranial fossa; in two cases also the middle cranial fossa. Operation and recovery in all.

GORHAM BACON.

232. CLEVELAND'S case was that of a child, aged six, who gave a history of earache during the previous winter. When first seen, there was a copious discharge from the right ear with two perforations in the drumhead. The patient died. At the autopsy, the petro-squamous sinus on the right side was found abnormally large and deep. At its anterior extremity, necrosis had taken place, and pus had entered the sinus causing a thrombus, extending backward into the lateral sinus. The thrombus extended down into the jugular vein and around posteriorly into the left lateral. The membranes of the brain, except over the sinuses and in the left cerebellar fossa, seemed normal.

GORHAM BACON.

233. HERZOG'S patient, aged nineteen, a well nourished man, never had previously an epileptic attack, nor were any of his family subject to nervous diseases. For three and a half years he had had a discharge from the right ear. An operation was performed and the mastoid found eburnated. The antrum was filled with cholesteatomatous masses and granulations. During his convalescence, the patient had a mild attack of influenza, complicated by an epileptic attack.

GORHAM BACON.

234. DENNIS reports three cases, the first two being cases of empyema of the frontal sinus. An operation was performed and the patients recovered. The third case was one of empyema of the ethmoid cells, and two weeks after the operation septic meningitis developed and the patient died.

GORHAM BACON.

235. MARCHAND considers it inadvisable to open the cranium through the mastoid. Cerebral abscesses proceeding from the

mastoid are rare (?). Intracranial complications of otitis are rare, particularly with our present therapy. The classical trephining done early is the best method of preventing these. The cranium should be opened only when there are very marked symptoms.

DUBAR.

236. Taking into consideration the fact that lesions of the epitympanum and antrum in the majority of cases of chronic otitis come on simultaneously, GRADENIGO believes the safest operative procedure to be the opening of both cavities from behind, *i. e.*, one opens the antrum extensively and then removes the upper and posterior wall of the canal and the outer wall of the aditus and epitympanum.

POLLAK.

237. According to OPPENHEIM the disturbance of speech occurring with otitic abscess of the left temporal lobe may be due to a lesion of the sensory speech centre or to an interruption of the tracts uniting this centre with other portions of the cortex. The latter is the more frequent, but both may be associated. The sensory aphasia, which is rarely complete, is mostly combined with paraphasia and amnesic aphasia. The comprehension of words spoken to the patient is not always affected; the inability to use sounds as speech causes amnesic aphasia.

When the tracts connecting the sound centre with the visual centre are involved there is optic aphasia. For example, the patient sees a bell, recognizes it, but can only recollect its name after he has heard it ring. A case of this sort was seen by Oppenheim. In such cases there may be partial word blindness due to the fact that in what the patient hears that portion is not perceived or only imperfectly, the understanding of which is brought about by the associated activity of the sensory speech centre and the visual centre. Thus if we say to such a patient "the banners wave," or "the sails swell," he will hardly understand it, since the sounds do not produce the conception that arises chiefly from the optic spheres. But if we say "have you a headache?" or "are you well?" he understands perfectly.

Oppenheim observed two cases of otitic abscess of the left temporal lobe with this form of acustico-optic aphasia.

H.

After describing the present status of surgery in respect to the operative treatment of brain tumors and epilepsy, BERGMANN (238) passes to a detailed description of the results of the surgical treatment of intracranial suppuration, limiting himself to the

otitic suppuration of the brain, meninges, and sinuses. He states that in 1,000 deaths, no less than 7 are due to otitic brain disease, and in 1,000 acute and chronic cases of suppuration 3-4 fatal brain complications arise, adding, however, that persons suffering from otorrhœa from early childhood frequently live to an advanced age. According to Körner the otitic diseases of the brain, meninges, and sinuses began as a rule at the point where the primary suppuration in the temporal bone extends into the contents of the skull.

Formerly in his brain operations, Bergmann's idea was first to strike the three convolutions of the temporal lobe, but now he takes the course recommended by aurists of first reaching only the tegmen tympani. And even in cases of cerebral suppuration following a septic fracture of the base when the infection has taken place from the external auditory canal, this spot should be sought, for the fracture can be thus found and drainage of the pus established through it. A man having a fracture of the base and a rupture of the drum membrane with hemorrhage from the ear came to the clinic in the second week after the injury, with high fever. Bergmann removed the roof of the tympanum and found pus between the bone and the dura. The patient recovered.

The brain-abscess operation is done by Bergmann in the following way: After disinfection of the region of operation, a cut is made upward just in front of the shallow furrow between the tragus and the helix, and the detachment divided in an arc. The cut-in continued 2-3 *cm* horizontally backward over the mastoid. The periosteum is retracted and the skin and periosteum of the canal drawn forward. A section of the bone is then made 2-3 *cm* upward from the junction of the linea temporalis with the incisura parietalis, and a second parallel section 3-4 *cm* farther forward, and the two united above by a horizontal section. The dura mata is then elevated and the tegmen exposed. When there is obstinate otorrhœa the middle ear should be opened through the mastoid. If there is a suspicion of sinus thrombosis, the sinus must be exposed and examined either from the mastoid or from the exposed upper surface of the pyramid. If it is filled with fetid pus the jugular vein should be ligatured. Iodoform-gauze tampons are used for the hemorrhage. If an abscess is to be sought in the cerebellum the region behind the mastoid must be exposed and the bone removed with Luër's gouge forceps. The abscess is usually found in the portion of the cerebellum adjacent to the sigmoid fossa.

H.

SPIRA (239) reports a case of sinus thrombosis cured by operation, and adds remarks on the indications for opening the mastoid process and on the diagnosis and therapy of sinus thrombosis.

NERVOUS APPARATUS.

241. DE COLLET. Auditory disturbances in tabes. *Congrès français de médecine interne*.

242. STIEL. A case of labyrinthine inflammation in late hereditary syphilis. *Monatssch. f. Ohrenheilk.* No. 8, 1895.

In 51 tabic patients COLLET (241) found a number of aural affections, mostly of the middle ear and not dependent upon the tabes. Sixteen cases seemed to be caused through the medium of the fifth nerve, there being concomitant anæsthesia, analgesia, lightning pains, loss of teeth, etc. According to his hypothesis there may be auditory disturbance in tabes through the auditory nerve or through the trophic branch of the fifth.

DUBAR.

In STIEL'S (242) case the disease had led to complete deafness and was complicated with left facial paralysis. Antisyphilitic treatment and later pilocarpine injections produced only slight improvement.

KILLIAN.

NOSE AND NASO-PHARYNX.

243. DUNN, JOHN. Growth of the aspergillus glaucus in the human nose. *Arch. of Otol.*, April, 1895.

244. FREUDENTHAL, W. The so-called bleeding polypus of the nasal septum. *Annals of Ophth. and Otol.*, iv., July, 1895.

245. WRIGHT. Mycosis of the nose and throat. *N. Y. Med. Journ.*, July, 1895.

246. SIMPSON, W. K. A consideration of some of the more important principles of intranasal surgery. *Ibid.*, Sept. 14, 1895.

247. RICHARDSON, J. B. Epistaxis. *N. Y. Med. Record*, July 27, 1895.

248. HITZ, H. B. Chancre of the tonsil. *Ibid.*, Sept. 28, 1895.

249. EVANS, T. C. Adenoid growths of the naso-pharynx. *Ibid.*, Aug. 31, 1895.

250. HOPE, G. B. Is acute amygdalitis in any way dependent on the rheumatic diathesis? *Ibid.*, Aug. 17, 1895.

251. LANPHEAR EMORY. Two cases of sarcoma of the tonsil. Death from ligation of the carotid in one, and from the growth itself in the second. *Ibid.*, Aug. 3, 1895.

252. DUNHAM, E. K. Case of large round-celled sarcoma of the tongue. *Fourn. Am. Med. Sciences*, Sept., 1895, p. 259.

253. WYETH, J. A. An original osteo-plastic operation for the removal of large vascular tumors growing in the vault of the pharynx, the antrum of Highmore, the sphenomaxillary and pterygo-maxillary fissures. *Fourn. Am. Med. Asso.*, Aug. 3, 1895.

254. BACON, GORHAM. A case of sarcoma of the neck involving the tonsil and causing deafness in a boy seven years of age. *Trans. Amer. Otol. Soc.*, 1895.

255. DELEVAN, D. B. The influence of chronic diseases of the throat upon certain defects of speech, especially stammering. *N. Y. Med. Journ.*, Sept. 21, 1895.

256. BARR, THOMAS. The treatment of adenoid growths in the naso-pharynx. *Lancet*, Sept. 14, 1895.

257. SHARP, GORDON. A case of chronic glanders in a horse-shoer. *Ibid.*

258. STRÜBING. On ozæna. *Münch. med. Wochenschr.*, Nos. 39-40, 1895.

259. RÉTHI. On the nature and curability of ozæna. *Arch. f. Laryngol.*, ii., 2.

260. LERMOYEZ. General technique of intranasal operations. *Ann. des mal. de l'oreille*, etc., No. 3, 1895.

261. FISCHENICH. On hematoma and primary perichondritis of the nasal septum. *Arch. f. Laryngol.*, ii., 1.

262. KUTTNER. The so-called idiopathic acute perichondritis of the septum. *Ibid.*

263. GAREL. Primary chancre of the septum.

264. RÉTHI. An unusual fibroma of the nasal mucous membrane. *Wiener klin. Rundschau*, No. 21, 1895.

265. LABIT. Syphilitic condyloma of the nasal fossæ.

266. RIPAULT. Vegetating nasal syphilides in the secondary stage of syphilis. *Ann. des mal. de l'oreille*, etc.

267. HAJEK. A case of empyema of the sphenoidal sinus with threatening symptoms of distension. Intranasal operation. Remarks on the diagnosis and therapy of empyema of the sphenoid. *Wiener med. Wochenschr.*, 32-33, 1895.

268. REINHARD. A case of primary carcinoma of the antrum of Highmore. *Arch. f. Laryngol.*, ii., 27.

269. GRÖNBECK. Nocturnal enuresis and adenoids. *Ibid.*, 2.

270. SIEBENMANN. On keratosis of the epithelium in the region of Waldeyer's adenoid circle, and on the so-called pharyngo-mycosis leptothricia (hyper-keratosis lacunaris). *Arch. f. Laryngol.*, vol. ii., 3.

271. GAREL. On a form of pharyngitis characteristic of diabetes or albuminuria. *Ann. des mal. de l'oreille*, etc., No. 2, 1895.

272. LERMOYEZ. On polypoid hypertrophies of the tonsil. *Ibid.*, No. 5, 1895.

243. DUNN reports a case of *Aspergillus glaucus*, and says that the case is interesting as showing that under certain conditions the spores of the aspergillus fungus may develop both mycelium and fruit-heads in the human nose.

GORHAM BACON.

244. The bleeding polypus of German (Lange, Schadowaldt, Heimann, Scherer, etc.) and American (Cobb, Wright) writers is an angioma of the septum. It has no connection with vicarious menstruation, which originates in other nasal regions, and is simply due to traumatism. These are FREUDENTHAL'S views, which are corroborated by a case of his own observation, which occurred in a female, æt. twenty-two, at the locus Kiesselbachii and bled profusely before and after operation, the hemorrhages causing extreme anæmia which persisted even after cauterizations had stopped them. A sister of the patient had died from sarcoma of the tonsil after operation. The microscopical examination revealed the tumor to be composed of connective tissue, an abundance of capillary blood vessels, particularly near the surface, and large endothelia, from which the development of capillaries was uninterruptedly progressing. Three drawings of microscopical sections accompany the instructive paper.

M. TOEPLITZ.

WRIGHT has microscopically found leptothrix to extend into the depressions between the protruberances of naso-pharyngeal lymphoid hypertrophy, but never in the acini of the glands. Indigestion may be an etiological link between dental caries and leptothrix. He reports four cases of females, two of which had white spots in the maso-pharynx, extending in one even to the mucous membrane of the inferior surbinated bodies. The other

two cases occurred in two sisters. WRIGHT believes that the affection gets well without treatment. He appends a beautiful illustration of a section through the tonsil with leptothrix, stained in lithio-carmin, to which some picric acid is added, and one of mycelial threads, stained with gentian-violet and decolorized by *Gram's* method.

M. TOEPLITZ.

246. SIMPSON says that the introduction of the principles of modern surgery for intranasal treatment marks a new era in combating nasal disease. Conservative surgery should be maintained in obstructive rhinitis. The comparative immunity from severe results after intranasal operations is due to the physiological protective resistance of the nose, which, when overtaxed, leads to disease. Interference before the establishment of permanent conditions is to be avoided, and then only resorted to on especial indication. The best operation is that which restores the parts as much as possible to their normal state. Intranasal antiseptics is necessary, asepsis impossible. Instruments, hands, and dressings should be aseptic, but tight plugging cannot be endured. The dangers of intranasal adhesions, narrowing of the nasal space, retention and absorption of secretions call for frequent dressing with application of cocaine, peroxide of hydrogen, alkaline antiseptics, and, finally, adhesive powders, containing stearate of zinc with aromatic iodoform.

M. TOEPLITZ.

247. RICHARDSON relates a case of epistaxis in a bleeder, aged thirty-eight, female; the bleeding originated in the junction of the floor of the right nostril and septum, three quarters of an inch behind the external orifice. Posterior plugging by means of BELLOCQ's canula, together with plugging from the anterior naris with small pledgets of absorbent cotton, one placed upon the other, did not prevent the hemorrhages from returning in regular attacks of from twelve to fifteen hours' duration, until the following solution was given internally:

℞	Hydrarg. bichlorid.....	gr. j.
	Acid Muriat dil.....	3 ij.
	Tr. Cannab. Ind.....	3 ij.
	Extr. Ergotæ. Fl.....	3 ij.
	Syr. Simpl.....	℥ j.
	Inf. Quassia.....	℥ ij. ss.
℥	Sol. L. Tablespoonf. in water t. i. d.	

M. TOEPLITZ.

248. HITZ's case, a male, aged twenty-eight, presented upon the left tonsil a large ovoid ulcer covered with a grayish white

necrotic coat. A deep verticle sulcus divided the surface. The base was firm and indurated, the lower border extended further down than usual, approached the median line and forced the pillars asunder; the upper margin was covered with small ulcers. A macular eruption upon chest and abdomen soon followed. The tonsillar lesion rapidly improved under mercurial treatment.

In the bibliography, the reviewer omits BULKLEY's exhaustive paper upon the subject, which has been reviewed in vol. xxiii., p. 127 of these ARCHIVES.

M. TOEPLITZ.

249. The function of the pharyngeal lymphatic ring consists in a phagocytic action, in health destroying the bacilli, but it serves also to convey the tubercle bacilli from its outer surface to the lung tissue, as is evident from Woodhead's researches. EVANS militates against the expectant treatment and the galvanocautery. He advocates the removal of the growths without anesthetics with Gottstein's curette and Cradle's forceps.

M. TOEPLITZ.

250. HOPE militates against the prevailing theory of the dependence of acute amygdalitis upon the rheumatic diathesis. His arguments are as follows: Rheumatism preferably attacks the sero-fibrous, not the muco-fibrous tissue. Recurring angina is rare in rheumatics. In later life, the tonsil is less subject to inflammation, while the gouty and rheumatic affections become more frequent. The administration of guaiac and the salicylates, therefore, is to be rejected, and also on account of the nauseating and depressing effect and the lack of abbreviating the duration (usually of from five to seven days) of the amygdalitis.

M. TOEPLITZ.

251. After a complete bibliography comprising 71 cases, LANPHEAR reports two cases of his own observation:

CASE 1.—A lady, aged fifty-six, had a swelling of the right tonsil, occluding the pharynx, and a mass, 3 to 4 inches in size, behind and below the angle of the jaw. Paralysis of the right side of face, severe pain. After a preliminary tracheotomy, during which the respiration ceased for twenty-seven minutes after insertion of the tube, consciousness returned. Three days later, through an incision made from the zygoma to the chin along the jaw, and a vertical cut up to the tip of the mastoid, after dissection of the jaw, the parotid and submaxillary glands, the tumor was cleared with ligation of the external carotid. In clipping the attachments, the internal carotid was cut through and the common carotid had to be ligated. The patient did not regain consciousness, and died seventy-two hours after the operation. Complete

hemiplegia and death were due to the lack of establishment of collateral circulation through the circle of Willis. The tumor was a round-celled sarcoma.

CASE 2 occurred in a man, aged sixty-three, as a swelling of the right tonsil, which rapidly grew. Partial removal of the tumor from the mouth. Spindle-celled sarcoma, which soon increased in a few weeks, and terminated the life in six months from the very first beginning.

M. TOEPLITZ.

252. DUNHAM reports a case of sarcoma of the tongue which occurred in a man, aged sixty-one, and was removed by Dr. I. D. Bryant. The patient, who was an excessive smoker, averaging about ten pipes a day, had bitten his tongue eight months before the operation, causing a persistent blister, which became irritated by decayed teeth and began to grow hard, after three months, to the size of $\frac{1}{4}$ inch in diameter. It was on the right border of the tongue about an inch from the tip, globular, smooth, without ulcerations, with broad attachment to the tongue. The microscopical examination, which was very exhaustive, proved it to be a round-celled sarcoma, of which twenty-two cases have been reported.

M. TOEPLITZ.

253. WYETH'S patient, aged eighteen, complained at first, December, 1892, of nasal obstruction, and March, 1893, of pains in the head, nervousness, asomnia, and anorexia. June, 1893, a "naso-pharyngeal polypus" was found, which, December, 1893, caused great agony by pressure on the brain. The growth was removed by Dr. Rufus Lincoln, June, 1894, with galvano-cautery, which caused great relief. July, 1894, swelling of left cheek and protrusion of the left eye, with rapid exhaustion of patient; November, 1894 (in spite of galvano-cautery, applied for the last time on December 8, 1894), together with loss of memory, great apathy, anæmia from hemorrhages, and asomnia. On December 12, 1894, the tumor, which originated in the naso-pharynx, had grown into the antrum of Highmore, breaking through its posterior inner wall, and into the spheno-maxillary fissure and the zygomatic fossa, pressing upon the blood-vessels of the eyeball, thus producing venous congestion of the cheek and the side of the face. An original and novel operation was performed and the patient prepared for immediate transfusion, if necessary, by insertion of a pipette into the median cephalic vein of the elbow. Anæsthesia with chloroform was preceded by two injections of morphine. The tumor was exposed by an incision along the temporal arch and around the orbit to the infra-orbital foramen, then

downward to the level of the ala nasi and outward through the cheek to the opening of Steno's duct, the tissues being only dissected off near the orbital cavity and the eye displaced to the right. A key-hole saw, passed into the anterior commissure of the spheno-maxillary fissure, sawed upward through the junction of the malar with the frontal bone, then downward through the floor of the orbital cavity, traversing the infra-orbital foramen and the antrum of Highmore at the level of the alveolar process of the upper maxilla. Fracture of zygomatic process of temporal bone by hook exposed the antrum of Highmore, zygomatic fossa, and the pterygoid and spheno-maxillary fissures. Tremendous hemorrhage ensued. The wound was packed with sponges and transfusion done with excellent result. The wound was exposed again and the tumor removed. By opening the mouth the pterygo-maxillary fissure and zygomatic fossa were exposed. The antrum was packed with iodoform gauze and the bones were replaced without bone sutures, but with stitching of the soft parts. The patient made an uninterrupted recovery. The motion of the orbicular muscle of the lids persisted even after division of the branches of the seventh nerve. (These tumors have been exhaustively described by Heinrich Bensch in his inaugural dissertation, and also by the same author in Voltolini's text-book on the diseases of the nose. Reviewer.) M. TOEPLITZ.

254. BACON's patient, a boy, aged seven, was first seen March 16, 1895. The history of the case was that five weeks previously the child complained of pain in the neck just below the left ear, and that in ten minutes' time a swelling suddenly appeared, as if an effusion of blood had taken place. The tumor was moderately hard and tense, but not painful, suggesting an othæmatoma. There was a small quantity of blood in the external auditory canal, and the inferior wall of the same was pushed upward and the drum-head swollen and bulging. The patient was not seen again for ten days. During this time the growth had increased very much in size and was irregularly lobulated. The left tonsil was enlarged. The boy was placed under ether and the growth incised. It was impossible to remove the growth on account of its attachments, so a slice only was cut off for microscopical examination. It proved to be a sarcoma. On March 30th, injections of the toxins of erysipelas and the bacillus prodigiosus into the growth were begun, according to the method suggested by Dr. W. B. Coley. The injections produced a considerable diminution of

the size of the tumor, but abscesses formed at the expense of the tumor which were opened, and two and a half ounces of pus were evacuated.

The patient developed septicæmia and died April 10th, the immediate cause of death being arterial hemorrhage from the tonsil.

GORHAM BACON.

255. DELAVAN states that, apart from defects of speech due to obstructions of the vocal resonant cavities, relaxation of the throat, particularly of the soft palate, influences the phonatory act in pronunciation. The central and neurotic origin of stammering is certainly supplemented by local conditions. Marked improvement in stammering has, therefore, followed the removal of obstructions and irritations of the throat, which, however, did not cure it absolutely. It is thus quite rational to eliminate diseases of the throat of stammering children, before the latter are placed under instruction. Paretic or feeble soft palates may be strengthened by galvanism, pronounciation of palatal sounds, exercises of its muscles, etc.

M. TOEPLITZ.

256. In a lecture delivered to the students at Glasgow, BARR dealt with the treatment of adenoid growths. After insisting on the importance of early removal, he thoroughly discussed the various methods of operating, advocating the use of Gottstein's curette, or some modification. For anæsthetic, he prefers chloroform, cautiously and sparingly given, to abolish corneal reflex, but not those of cough and swallowing. He drew attention to the importance of having a competent anæsthetist with special experience, who would not leave the patient until satisfied that he is safe out of the anæsthetic. For after-treatment, rest in bed for two days and confinement to the house for a week, and no local treatment whatever. As regards hemorrhage, he has found it very rare, and advocates the sucking of ice for twenty-four hours and avoidance of hot liquids and solids. In every case, if bleeding is severe, he employs pressure upon the roof of the pharynx by means of forceps holding a fold of cotton moistened with some styptic. If enlarged tonsils are also present, he prefers to remove them without an anæsthetic some time before operating on the growths. For persistent mouth-breathing after all mechanical obstruction has been removed, he first causes the patient to sit still for fifteen minutes, twice or thrice daily, with the mouth closed, and if after some time this proves insufficient he employs some mechanical appliance which is worn at night.

257. On coming under SHARP's observation the patient, aged twenty-three years, was found to have a foul, watery discharge, tinged with blood and mixed with pus, from the left nostril; the nostril was inflamed, and covered with black sloughs, which on being removed revealed an ulcerated surface; the left eye inflamed and discharging foul watery matter; below the eye the tissue of the face had sloughed away, exposing the bone covered with black sloughs. No syphilitic history. At the end of three months the temperature rose and a considerable area of the superior maxilla was laid bare, the side of the nose having nearly disappeared. Inside the mouth the hard palate was covered by a black slough, and an opening led from the mouth to the opening at the side of the nose. The disease rapidly extended, the patient dying from exhaustion, having been ill with the disease for fifteen months.

258. STRÜBLING made a bacteriological examination in one hundred cases diagnosed ozæna and found in every one the bacillus of ozæna, which is not found in other diseases. He believes that the bacillus causes a hypertrophic inflammation leading later to an atrophic inflammation.

MÜLLER.

259. RÉTHI understands by ozæna that chronic nasal catarrh which has a specific and characteristic odor. In the mucosa he always found fatty degeneration of the glandular and infiltrating cell, and a transformation of the epithelium into pavement epithelium with thickening of the vessel walls. Superficial cauterization of the entire diseased membrane with the galvano-cautery, chromic acid or trichloroacetic acid lessens or destroys the odor.

ZARNIKO.

261. According to the experience of FISCHENICH hematoma of the septum arises most frequently from trauma, although a fracture of the cartilage is not necessary. The blood is rarely absorbed spontaneously and the usual termination is suppuration or the formation of a serous cyst. Early incision is indicated. The author reports also two cases of primary perichondritis of the septum. In both cases a painful swelling of the nose came on with general malaise and a soft, red tumor appeared on the septum, from which a clear serous fluid escaped on puncture. The cartilage was perforated. In one case the cause was not discovered, the other was due to carious front teeth in the upper jaw. Both cases were cured after free incision.

ZARNIKO.

262. KUTTNER's three cases had a similar history. The septum, without discoverable cause, became the seat of an acute inflammation leading to suppurative destruction of the tissues. The febrile symptoms accompanying the affection yield after the pus is permitted to escape. Instead of calling this affection "idiopathic acute perichandritis," as Lublinski terms it, he suggests the name "acute abscess or acute phlegmon of the septum."

ZARNIKO.

263. GAREL reports very convincing cases of chancre of the septum coming on without signs of syphilis elsewhere, and being followed later by the usual secondary symptoms. These chancres he supposed to arise from infection of the septum by means of the fingers

DUBAR.

264. RÉTHI removed from the left nostril by means of a snare a tumor 9.5 *cm* long, and 9 *cm* in greatest circumference. It proved to be a hard fibroma, with a pedicle similar in structure to a mucous polyp with some tracts of connective tissue.

POLLAK.

265. LABIT adds another case to the three already published. There developed in a woman rapid symptoms of nasal obstruction. In the anterior portion of both nostrils grayish colored, deeply furrowed growths were seen, which were hard and not compressible. Under antisiphilitic treatment the tumors disappeared rapidly. In the cases previously reported, other secondary signs of syphilis were present with the condylomas. In this case the tumors developed in the tertiary stage.

DUBAR.

266. In RIPAULT's case, gray, irregular, soft growths that were thought to be tuberculous were removed, but recurred several times. They were finally permanently cured by mercury. The author emphasizes the rarity of these growths in secondary syphilis.

ZIMMERMANN.

267. HAJEK places no importance on the subjective symptoms, but states that the differential diagnosis between ethmoid and sphenoid troubles may be made by rhinoscopic examination. The former is present when the olfactory fissure is wide enough to allow the secretion to be seen coming from the opening, or a probe may be introduced or the secretion washed out with a fine canula. If the fissure is too narrow, the anterior wall of the ethmoidal cells may be opened. In such cases sponge tents are used to widen the fissure. If the middle turbinate is hypertrophied, parts of it should be removed, until the anterior wall of

the ethmoid is reached. When the cells are opened, the therapy consists in injections of nitrate of silver of gradually increasing strength. It is mostly necessary to enlarge the opening, and the author does this by means of a small hook with which he breaks off small bits of bone, or Hartmann's instrument is used. As after treatment he syringes out the cells with 3 % boric acid solution, and injects 5-10 % solutions of nitrate of silver.

POLLAK.

268. In REINHARD's case a diagnosis of empyema of the antrum had previously been made, but on passing a sound through the opening left by removal of a tooth, soft masses were discovered which proved to be an epithelial carcinoma. The upper jaw was removed, but the growth could not be entirely eradicated.

ZARNIKO.

In 28 of 198 cases of adenoids, GROENBECH (269) found nocturnal enuresis. In 23 of these the enuresis stopped after the adenoids had been removed, and in several came on again when they recurred.

ZARNIKO.

270. SIEBENMANN observed six cases, which he describes. He concludes that Fraenkel's benign tonsillar mycosis or Heryng's pharyngomycosis leptothricia, with its formation of solid horny matter, should be taken from the category of mycoses, and put in that of hyperkeratoses of the mucosa. As a product of a less complete keratosis should be regarded the less complete epithelial keratosis which is found in all tonsils, and which is an excellent medium for the development of the organisms of decomposition. The collection of incompletely keratosed epithelium is therefore a constant menace to the surrounding tissues, analogous to cholesteatoma of the middle ear. It is desirable to regard from a common standpoint the keratosis of the pharynx, pachydermia laryngis, leucoplakia oris, the black tongue, rhinitis atrophica, rhinitis anterior sicca, and otitic cholesteatoma, and particularly to give cholesteatoma of the middle ear a place in this category, and to do away with the puzzling features of its pathogenesis that have divided aurists and some pathologists.

271. In a man of forty-three, LERMOYEZ found a lobulated tumor of the tonsil that resembled in structure the structure of the normal tonsil, but had some peculiarities.

ZINNMERMANN.

MISCELLANEOUS NOTES.

THE SIXTH INTERNATIONAL CONGRESS OF OTOTOLOGY will meet in London, 1899, under the presidency of Professor URBAN PRITCHARD.

THE LIVERPOOL EYE AND EAR INFIRMARY has lately received a *legacy* of £300 from the late Mr. JOHN HUGHES of Sefton Park, Liverpool, and another of £100 from the late Mr. WM. WOOLFALL, of Liverpool and New Brighton.

APPOINTMENTS.

ST. CLAIR THOMSON, M.D., F.R.C.S., has been appointed Assistant Surgeon to the Royal Ear Hospital.

The Glasgow University has established a lectureship on the Diseases of the Ear, and Dr. THOMAS BARR has been appointed lecturer, the appointment having been offered to him by the University Court (without inviting candidates). The institution of the new chair is a gratifying evidence of the importance now attached to this department, and a just acknowledgment of the unexcelled competency of Dr. Barr.

In the now completed extension of the Vanderbilt Clinic of the College of Physicians and Surgeons (of Columbia University), New York, the Ear Department has received adequate quarters, which it formerly lacked. Professor ALBERT H. BUCK and his assistants now have the facilities requisite for the treatment of patients and drilling of students. In this college, otology, as well as the other specialties, are represented by clinical professorships; the attendance of the clinics is obligatory, and the students are required to pass a satisfactory examination before obtaining their degree.

CORRECTION, BY H. KNAPP.

In my sketch on the life and work of the late Prof. Moos, by an oversight of mine, on page 411 of vol. xxiv. at the end of the sentence: "*In the second series of seven years (1879-85) he (Moos) published 47 papers*" the words "*among which 17 in conjunction with DR. STEINBRÜGGE*" have been omitted, and should be added in the above place.

Contents of the last numbers of the *Zeitsch. f. Ohrhk.*

Vol. xxvii., Nos. 3 and 4, issued November, 1895.

STAN. V. STEIN. Disturbances of Equilibrium in Aural Affections. Concluded. Translated in this number. The remainder are translations from the English edition, reports, and reviews; the reports have been translated, the reviews will be.

G. BRUNNER. Diagnostic Value of the Upper and Lower Tone-Limits.

E. BLOCH. The Diagnosis of One-Sided Deafness.

Vol. xxviii., No. 1, issued December, 1895.

BORIS WERHOVSKI. Examination of the Duration of Audition in Diseases of the Middle and Inner Ears (3 plates).

ZWAARDEMAKER. Acoustic Railway-Signals and Sharpness of Hearing.

WALTER HÄNEL. Incipient Perforation of Both Labyrinth Windows, in Tuberculous Caries of the Middle Ear, with Microscopic Examination (2 plates).

Translation from the English edition.

Report on Progress (translated).

Vol. xxviii., No. 2, issued March, 1896.

R. BALDEWEIN. The Rhinology of Hippocrates.

H. ZWAARDEMAKER. An Initial Symptom of Sclerosis.

P. CRULL. Congenital Occlusion of the Right Choana.

E. SCHMIEGELOW. Otitic Intracranial Complication. Operation. Recovery.

Translation from the English edition.

Report on the Meeting of Hungarian Aurists.

Report on Progress. 4th quarter '95. To be translated in our April number.

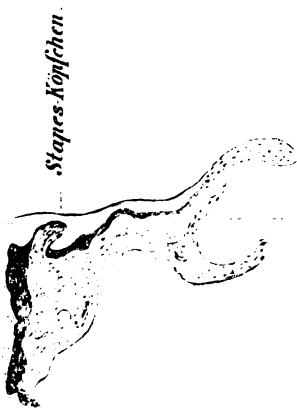
Book Reviews.

NOTICE.

The Editors repeat that subscribers who wish to read articles in the German Edition that have not yet appeared in the English, or have been reproduced there only in an abridged form, can always obtain, for temporary use, such articles, on application to DR. KNAPP, 26 West 40th Street, New York, for America, and to Mr. I. F. BERGMANN, publisher, 20 Schwalbacher Strasse, Wiesbaden, for England and its Colonies.



Fig. II.



N. fac.



Fig. III.

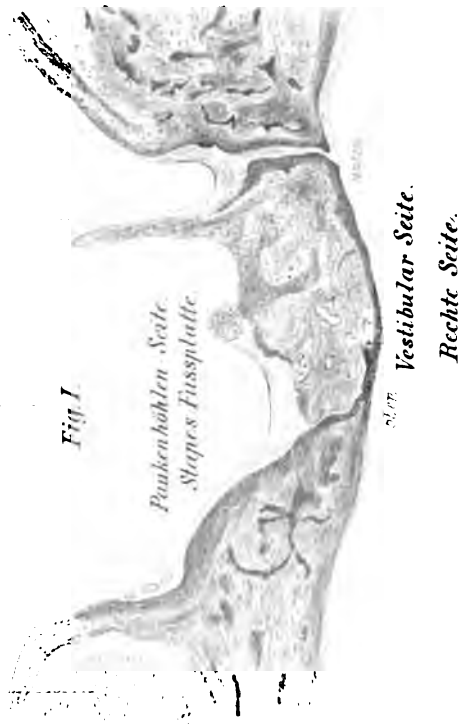


Fig. I.

ARCHIVES OF OTOLOGY.

THE HEARING POWER IN CASES OF BILATERAL CONGENITAL ATRESIA OF THE AUDITORY CANAL WITH RUDIMENTARY AURICLE.

BY PROF. F. BEZOLD, MUNICH.

Translated by Dr. WARD A. HOLDEN.

IN the course of years I have twice had the opportunity of observing cases of bilateral congenital atresia of the canal with rudimentary auricle, and in both I was able to make careful tests of the hearing.

Since the deformity affects the hearing so much that a whisper cannot be heard and conversational tones must be used in testing, it is clear that reliable results can be obtained only when the deformity is bilateral.

CASE 1 (seen in 1891).—M. D., a boy of twelve, is of healthy parentage, nor is there consanguinity, and the two other children of the family are healthy. In place of the auricle is a longitudinal fold 46 mm long on the right side and 43 on the left. No trace of canal. Mastoid process well developed and the articular process of the lower jaw rests directly on the mastoid. The child began to speak at the age of eighteen months, but only learned to speak well at the age of four years.

For the whispering voice all numbers, excepting 5 and 9, which are not understood, are heard directly before the ear; for the conversational voice the hearing distance is 12 cm on each side; 4 and 3 are recognized with the greatest difficulty; the other numbers are understood in part at 20 cm.

Tested with the continuous series of tones

the lower tone limit for air conduction on each side is d^1

upper tone limit Galton's whistle $\left\{ \begin{array}{l} \text{right } 4.0 \\ \text{left } 4.1 \end{array} \right.$

No defects either for forks or for whistle. The duration of perception for Lucae's forks c^4 and f^{24} by air conduction was 0.4 of the normal.

The fork A on the vertex is heard 8 sec. and the fork a^1 6 seconds prolonged.

Rinné with a^1 $\left\{ \begin{array}{l} \text{right} - 15 \text{ sec.} \\ \text{left} - 20 \text{ sec.} \end{array} \right.$

The boy was mentally well developed and the results obtained are reliable.

As this was not the case in the next patient, the duration of perception on the vertex is not set down. Having no continuous series at that time excepting the Galton whistle, the lower tone limit could only be determined approximately.

CASE 2 (seen in 1889).—S. H., a girl of seven years, of healthy family, had in place of the right auricle only a vertical fold of integument containing a cartilaginous mass. On the left side the rudimentary auricle had a helix, an antihelix, and a fairly developed lobule. A cartilaginous tragus and antitragus near each other could be felt under the skin, and between the two a small funnel-shaped depression indicated the location of the cartilaginous canal. The rudimentary auricle seemed to rest directly on the articular process of the lower jaw on each side. The child speaks familiar words readily, but repeats new words with difficulty.

The whispered voice is heard imperfectly directly before the ear.

Conversational voice $\left\{ \begin{array}{l} \text{right } 30 \text{ cm} \\ \text{left } 18 \text{ cm} \end{array} \right.$

for the numbers 5 and 9, while the other numbers are recognized at a greater distance.

A watch usually heard at 1 m distance is heard on each side when pressed on the ear. The forks f^{24} , f^3 and a^2 were all heard by air conduction and when placed on the vertex or on the ear. Below a^1 no forks were heard by air conduction, but a^1 , a , A , F^{-1} and C^{-1} were all heard by bone conduction. All organ-pipe tones down to f^2 , the lowest, were heard on each side. The upper tone limit with Galton's whistle was 4.5 on each side.

This case is of particular interest since Dr. Rotter undertook to find the canal on each side by operative measures. After detaching the skin and cartilage the articular process was exposed, but no trace of canal was found. The wounds were closed with sutures and healed by first intention.

The results of the tests of hearing with allowances for the youth of the patient and the means that were then at my command, were altogether similar to those obtained in the other case; and a similar result was obtained by Schwendt.¹

To determine the morphological peculiarities which underlie the form of auditory disturbance found in these cases, an abstract of the literature of autopsies in cases of atresia (13 cases) was made by my pupil, Joël ("On Atresia Auris Congenita," these ARCHIVES, xviii., p. 317). Three later cases have been reported by Ranke. These are as follows:

Author and Journal.	Age.	Tympanum.	Ossicles.	Windows.	Labyrinth.	Hearing.
H. v. Ranke, <i>Report of Society of Morph.</i> , Munich, 1885, 2d part, p. 130.	1½ years.	Wanting.	Wanting.	Wanting.	Normal.	—
Bezold, cf. Joël, <i>Zeitschr. f. Ohrenh.</i> , xviii., p. 278.	8 mos.	Small.	Stapes lost in maceration, malleus and incus wanting.	Oval window reduced ¼; round window normal.	Normal.	—
H. v. Ranke, <i>Münch. med. Wochenschr.</i> , 1893, No. 37.	5½ mos.	Cleft.	Malleus and incus a single bone.	Windows not exposed.	Normal, but smaller than the other.	—

Thus the disturbance seems to be limited to the outer and middle ear, and affects particularly the annulus tympanicus which has mostly been wanting, then the malleus and incus which are absent or rudimentary, and as a rule also the stapes. In ten of the sixteen cases the labyrinth was entirely normal, corresponding to the auditory results we have obtained. In both of my cases the lower end of the scale was wanting for air conduction, but by bone conduction the entire scale from C^{-1} to the highest pitch of Galton's whistle was perceived. No breaks were found that would indicate labyrinthine involvement.

The hearing power in these cases may be considered that of an intact labyrinth shut off from the action of aerial waves of sound (except in so far as these may be carried to

¹ "On Congenital Deformities of the Auditory Organ in Connection with Branchiogenic Cysts and Fistulæ."—*Arch. f. Ohrenh.*, xxxii., p. 37.

the stapes through the Eustachian tube), and with disturbances in the conducting chain.

If the labyrinth is normal we must suppose the auditory disturbances to be due not only to the shutting off of the labyrinth from external communication, but also and in equal measure to the anomalies in the conducting apparatus, for simple closure of the bony canal, as for example by a plug of cerumen when the middle ear is normal, does not reduce the hearing to the degree that we find it reduced in these cases of atresia. The abnormalities in the conducting apparatus in cases of congenital atresia are so manifold that in considering their influence on the function of the ear, it is impossible to bring them into a single category.

Leaving out of consideration the reported cases in which labyrinthine anomalies have been found, it must remain an open question whether there can be any hearing when the tympanum is entirely absent.

It must also remain doubtful whether there can be any hearing when one or both labyrinth windows are congenitally absent.

Apart from the two cases reported of total absence of the tympanic cavity, an absence of both windows has been noted only once (in a deaf patient of Lucae's). In two other cases the oval window was found to be diminished in size. The round window was found to be small in two cases, normal in two, and no statement in regard to its size is mentioned in the others.

As respects the conducting chain, a regular drum membrane with a malleus was not found in any case. The ossicles were mostly absent, and when present were rudimentary, the stapes only being in a few cases but slightly abnormal.

It should also be noted that in four cases it was stated that there was fixation of the foot plate, three times from bony ankylosis, although in only a few cases the condition of the stapes was mentioned.

In grouping together the results of auditory tests in these cases we find (1) a lengthening of the normal time for bone conduction, (2) a marked negative Rinné, and (3) a defect

for low tones by air conduction. Thus we have the same symptom complex in cases of congenital atresia of the canal that we find in acquired disturbances in the conducting apparatus, and particularly in fixation of the stapes. From this we may draw the conclusion that in the cases of deformity the cause of the disturbance of hearing also has its location, not in the inner, but in the middle and outer ear.

A CONTRIBUTION TO THE DIAGNOSIS AND
TREATMENT OF CHOLESTEATOMA IN OTI-
TIS MEDIA PURULENTA CHRONICA.

BY A. SCHEIBE, OF MUNICH.

Translated by Dr. A. B. KIBBE, Seattle, Washington.

AS is well known, pathologists and aurists generally differ in their views as to the place in pathology to be assigned to cholesteatoma of the middle ear. The former, as a rule, agree with Virchow, that it is a primary tumor-formation, while aurists, arguing from both pathology and clinical experience, are, at least, unanimous in the opinion that in the vast majority of the cases it is not a primary tumor-formation, but rather that its pathology consists in the replacement of the epithelium of the mucosa by an epidermic covering, the superficial layers of which are cast off and collected in the form of tumor-like masses. It is to be expressly emphasized (see Steinbrügge, *Pathological Anatomy*) that not the dead and exfoliated cells are to be considered as the pathological foundation of cholesteatoma, but rather the matrix, the rete of the epidermis itself. From this it is evident that the diagnosis of cholesteatoma of the middle ear can only be made with certainty if by inspection an epidermic transformation of at least a part of its mucous membrane can be demonstrated. Likewise the presence of cast-off scaly epidermis masses in the middle ear are to be looked upon as favoring the diagnosis. Bezold has called attention to a further and important diagnostic aid in the position and character of the perforation in the drumhead: "As soon as the sharp boundary between the cutis and mu-

cosa disappears at any point by a destruction of the surface, we observe the cutis (or epidermis) spreading out and gradually replacing the mucosa. So long as the perforation in the drumhead is central, even though extensive in area, the mucosa shows no epidermic coating,"—the remains of the drumhead at the periphery acting as a protective wall against the encroachment of the epidermis. In many cases the epidermic transformation is not visible by direct inspection, and is demonstrated only when repeated syringing with the tympanic tube has brought away cholesteatomatous masses.

In order to test the truth of Bezold's statements in detail, I have used material from my private practice as well as results of autopsies collected by Prof. Bezold and kindly placed at my disposal.

Two questions are to be answered :

1. In what percentage of cases of middle-ear suppuration, on the one hand with peripheral perforations, and on the other with central, but with adhesion of the edges of the perforation to the inner wall of the tympanum, may epidermoidal change or collections of epithelial masses be demonstrated?

2. Does cholesteatoma occur also in chronic suppuration of the middle ear with central perforation and completely free edges of the same?

Cases under 1 may be divided into two groups :

a. All cases of central perforation with adhesions of the edges, and those peripheral perforations which border on the walls of the tympanum.

b. Cases of peripheral defects which border on the wall of the aditus—that is, perforations in the superior and superoposterior border. Perforations through Shrapnell's membrane also belong to this class.

In group *a* the diagnosis of the epidermoidal transformation can be made by examination with the mirror. In certain cases active inflammation or granulations may render the diagnosis at first impossible, but treatment of these conditions will finally render it certain.

The diagnosis in class *b* is essentially difficult. Otoscopic examination alone is not sufficient. Operative opening of

the diseased spaces is, in many cases of narrowing of the meatus, the only method of rendering it certain, but is not justifiable for such purpose alone. The use of the tympanic tube is not only indicated but is indispensable, but in its employment certain precautions are necessary. The meatus must first be thoroughly cleansed in order to make certain that the collections of epidermis come from the middle ear. In many cases these masses are not seen at the first syringing but only after several trials.

By aid of this method I was able to demonstrate in 48 cases in part epidermoidal change in the mucosa of the aditus, in large defects of the meatus, sometimes up to the antrum; in others I could demonstrate the presence of cast-off layers of epidermis in the upper middle-ear spaces. In each of these 48 cases a perforation existed such as is described in group *b*. Pure cases of perforations of Shrapnell's membrane were rarely seen. Not uncommonly the defect extended to the adjacent upper or posterior wall of the meatus. Combinations of both these forms were often observed. In many instances, in addition to those of group *b*, some belonging to group *a* were met with, particularly adhesions of the anterior edge of the perforation to the inner wall, also central perforations with completely free borders. In addition, the findings in 14 autopsies of cholesteatoma of the upper spaces of the middle ear were placed at my disposal as further material to assist in answering the first of the above questions. In 12, ear disease was the cause of death, in others its discovery was accidental. Of the 12 cases 6 were seen during life, all with more or less strongly pronounced pyæmic or cerebral symptoms. In 5, operative interference was undertaken in spite of the apparently hopeless conditions. In 1 the thrombosed lateral sinus was opened. The otoscopic findings were as follows: In the 2 cases not resulting in death, perforation of Shrapnell's membrane once, exposure of the posterior upper portion of the margo tympanicus once. In the 12 ending fatally, defect of Shrapnell's membrane and in part of the adjacent tissue 6 times, defect of the drumhead up to the posterior upper rim of the margo also 6 times. In 4 of the

latter the adjacent posterior upper wall of the meatus was wanting, though not having been removed by operation. In 4 cases the findings show adhesion of the isolated manubrium twice, and adhesion of the edge of the perforation in the drumhead to the inner wall of the tympanum twice.

Cannot the deduction therefore be made as a general rule *that where a peripheral perforation exists or there is a central one, but the edge of the latter is adherent to the inner wall of the tympanum, cholesteatoma must always be present?*

To decide this question, it is necessary to ascertain how cholesteatoma originates, and of what secondary pathological changes the cholesteatoma matrix is formed.

With reference to its origin, the Bezold-Haberman theory, that the epidermoidal transformation of the mucosa of the middle ear arises from the direct inward growth of the epidermis of the drumhead or of the meatus upon the mucous membrane deprived of its epithelium, that what is termed cholesteatoma is nothing more than a process tending toward a cure, is continually gaining more adherents.

The most certain substantiation of this theory is obtained by autopsies. In those above mentioned, where attention was paid to this point, direct connection with the epidermis of the meatus was never missed.

Relative to the second of the two questions, "Does cholesteatoma occur in chronic suppuration of the middle ear with central perforation and completely free edges?" I have never been able to demonstrate it in any case observed clinically, nor among those autopsies coming under my observation.

As a criterion of the various means of diagnosis I have tabulated the results in my 48 cases of cholesteatoma of the upper middle-ear spaces with the following results: Opening the antrum always rendered the diagnosis certain if resection of the posterior wall of the meatus was combined with it (5 times). Schwartze's operation, on the contrary, failed twice in 4 cases. Otoscopic examination resulted in direct demonstration in 75 per cent. of the cases. By aid of the tympanic syringe cholesteatomatous masses were discovered in 91 per cent.

The difficulties in diagnosis, like the difficulty in treatment, vary according to the locality of the epidermisation. If this be confined to the tympanic portion of the middle ear, treatment is simple. These cases are quite as amenable to boracic acid treatment as are uncomplicated cases of middle-ear suppuration.

The same process which in the tympanic cavity is to be looked upon as a healing one, may lead to the severest consequences as soon as it extends to the aditus and antrum. From the drum cavity the masses of cast-off epidermis may be eliminated without hindrance; from the upper spaces, however, a complete elimination is almost impossible, owing to the narrow passage. As long as these masses remain, they act as foreign bodies which increase suppuration, and produce further keratosis of the epidermic covering.

Few cases are cured by antiseptic treatment restricted to the tympanic portion of the middle ear, and then only when the perforation is wide, and gives free egress to the epidermic masses.

In my practice 48 cases of cholesteatoma were met with in 145 cases of middle-ear suppuration. Of this number 3 were well when they came under observation.

Of the remaining 45, 38 were treated by direct injection and insufflation. Of these there were cured 18, or 47 per cent. Still under treatment 11, or 29 per cent. Disappeared, 8, or 21 per cent. Of the latter, 1 is reported to have died later from cerebral abscess. Cured by chiseling, 1, or 3 per cent. The average number of treatments in each case was 13—least number, 1; greatest, 103.

Only two reports on the results of direct injection and insufflation are at hand. Gomperz¹ reports the history of 49 cases, in part with cuts, of the drumhead; 36 were cured, 3 uncured, and 10 abandoned the treatment,—certainly a good result. Siebenmann² reports only the cases in which the cure persisted for a number of years. They composed about one fifth of the number. A further method is the removal of the ossicles through the intact meatus (Kessel, Schwartze),

¹ *Monatschr. f. Ohrenhkl.*, 1892, No. 12.

² *Berlin. klin. Woch.*, No. 33, 1893.

or after drawing out the cutaneous meatus and chiselling away the outer wall of the aditus (Stacke). This is often practised in cholesteatoma of the upper middle-ear spaces.

Schmiegelow¹ has lately reported unusually good results with Stacke's operation. Of 40 patients with cholesteatoma 9 were treated by chiselling open the aditus. Of these 8 were cured, though 2 suffered from recurrence later.

In such cases chiselling away the external wall of the aditus without extraction of the ossicles may suffice for a cure. What has been often through careless observation called caries of the ossicles, is simply the healing stage of this disease and of rarefying otitis or pressure erosion. In my practice and in the clinic I know of no case of cholesteatoma in which a diseased ossicle has prevented a cure, provided the opening into the cavity was sufficiently large. When one or several of the small bones were removed this was done solely to provide better access for the tympanic tube, and without regard to whether it was diseased or not. For this purpose removal of the hammer alone usually sufficed.

Undoubtedly the most radical method of cure in cholesteatoma of aditus and antrum is the chiselling of the mastoid process,—either the simple opening of the antrum, after Schwartze, or the latter in combination with resection of the upper and posterior wall of the bony meatus. This method was essentially improved by Stacke; and finally Siebenmann published a procedure by which it is possible in every case to retain an opening posterior to the auricle and to shorten the time of treatment to from 4 to 6 weeks. Combining resection of the posterior wall of the meatus with opening the antrum not only assists in removing disease products (particularly from the aditus), but gives a permanent wide opening to the diseased spaces either through the meatus or back of the auricle.

Experience up to this time has shown that the percentage of cures is higher, the stage of recovery shorter, and recurrences may be treated by conservative measures without operative procedure.

¹ *Zeitschrift f. Ohr.*, Bd. 25, S. 100.

From all available evidence it seems to us that Siebenmann's modification is to be preferred to Stacke's, particularly in large cholesteatomatous cavities; and in such patients after-effects which might result from the open cavity back of the ear have not been observed.

In some particulars we have deviated from Siebenmann's procedure. We carry the cutaneous incision only as far forward as the anterior point of insertion of the auricle, and do not carry the incision here through the periosteum. Further we chisel away the posterior wall of the meatus progressively from without inward. The skin flap, according to Schwartze, we replace by Thiersch grafts, even in large retro-auricular openings.

Drumhead and ossicles we have often allowed to remain. Caries and rarefying osteitis of the ossicles appear regularly to undergo recovery under antiseptic treatment after removal of the cholesteatomatous masses, which are certainly a frequent cause of disease of these bones. We have not come to this conclusion from operated cases solely, as the numerous cases treated by the conservative method alone have been decisive.

Conclusions.—If urgent symptoms exist, chiselling of the mastoid combined with resection of the posterior meatus wall is at once undertaken. At the same time we use Siebenmann's procedure.

If urgent symptoms are wanting, injections and insufflations by aid of the tympanic tube may be employed after removal of granulations by snare or curette, should any be present. If the passage to the aditus be too narrow, the hammer is removed.

Obstinate persistence of fetor in spite of continued treatment is an indication for resection of the posterior wall, even though severe complications are wanting.

Occasional examination appears to be necessary for cholesteatoma patients,—both those having undergone operations as well as those treated by conservative methods.

CONTRIBUTIONS TO THE BACTERIOLOGY OF OTITIS MEDIA PURULENTA.

BY LEOPOLD STERN, OF METZ.

Translated by Dr. A. B. KIBBE, of Seattle, Washington.

THE number of cases of otitis media purulenta chronica which have been examined bacteriologically is, up to the present time, too small to form a clear idea of the bacteriology of this disease.

Zaufal who collected the results of all examinations up to 1891, makes this statement :

“A pure culture of any micro-organism is rarely found in the secretion of otitis media purulenta chronica; as a rule, there is a variety of bacteria, particularly in neglected otorrhœa and where the secretion is stagnant.”

From all the examinations reported one fact is prominent, namely, that this disease furnishes a good culture medium for the growth of the most varied micro-organisms.

The material for this article was taken from the clinic of Prof. Bezold under his direction, and the bacteriological examinations were made in the laboratory of Prof. Emmerich.

The secretion was taken from such patients only as at the time of examination were not undergoing treatment and in whom contamination of the meatus by oil, etc., could be excluded.

The discharge was taken from the tympanum with a sterilized platinum needle through a sterile speculum and transferred at once to sterile water. By aid of a cotton-wrapped probe a second specimen was next obtained and

spread on cover glasses, of which one was stained in the usual manner with aniline water, gentian violet, or carbolic fuchsin, the other by Gram's method. In a few cases, particularly those in which the secretion was very slight in amount, the material was obtained by pouring warm sterile water into the previously sterilized meatus and tympanum and collecting it again in a test tube the rim of which was again sterilized by heat.

Both methods gave analogous results. In numerous instances an agar tube was inoculated but Fraenkel's diplococcus was never found.

The present experiments, which, like those of previous investigators, failed to show any bacteria characteristic of otitis media purulenta, have in view as their main object the bacteriological character of the secretion in the various phases of this disease.

In purulent otitis media three phases may be distinguished, differing from one another by the varying character of the secretion. The latter may be :

1. Moderately or very profuse, muco-purulent, not fetid.
2. The same, but fetid.
3. Thick, partly inspissated, and fetid.

The first is characteristic of the acute attacks occurring during the course of the chronic variety.

The second, of those cases which have existed some time and in which the discharge is profuse.

The third, cases having undergone partial recovery and in which the secretion is limited to small areas.

The characteristic feature of a fresh inflammation is an odorless discharge produced by certain species of pyogenic organisms. This we find in primary acute otitis media purulenta which shows the pyogenic bacteria solely.

Finding this condition by microscopic and bacteriological examination in a case of fresh suppuration in a case of otitis media purulenta chronica which has for some time been free from discharge, one may look upon it as analogous to the primary acute form.

The following cases will illustrate this point :

CASE I.—M. K., aged five. Otitis med. pur. chron. R. L.

Left ear at present free from discharge. Occasional attacks of suppuration in both for three years. Right has been discharging for one day only. Cover-glass preparations show only cocci. On gelatine plates, staphylococcus pyogenes albus solely.

CASE 2.—H. S., aged twenty-seven. Intermittent discharge from both since scarlet fever during his first year. Right only, discharging for past three days. Discharge moderately profuse, muco-purulent, not fetid. Cover-glass preparations, some stained by Gram's method, show occasional mono-, diplo-, and staphylococci. On gelatine plates a few colonies of staphylococcus pyogenes albus. On agar nothing grew.

In both of these cases the exciting agents originated in the inflamed pharynx and gained access to the ear by way of the Eustachian tubes. The following is an example of infection through the external meatus.

CASE 3.—J. F., aged thirteen. Otitis media purulenta chronica of right ear of six months' duration during first year. Four days ago, after bathing, discharge returned. Moderately profuse, muco-purulent, and odorless. Edge of perforation covered with red, glistening granulations.

Cover-glass preparations show few bacteria, short rods, and rods of the size of tubercle bacilli, but thicker; also cocci in the form of diplo- and staphylo-cocci.

On gelatine plates and agar tubes the *bacillus coli commune* alone grew.

The positive statement of the mother that the discharge had begun but four days prior to the examination as well as the absence of fetor permits us to consider the case as an acute occurrence, opposed to which, however, the granulations must be considered. In spite of this we may consider it as a transitional form from the first to the second phase. No fetor in spite of the presence of bacilli. Probably the water played some part in producing the recurrence of suppuration. The bacterium coli commune not previously found in the ear probably gained access through the perforated drumhead by way of the external meatus. What role it played there, whether a pyogenic or that of a simple saprophyte, is uncertain. The observations made recently

in inflammations of other localities are indicative that this bacterium alone was present and that in this case the relations were reversed, rods as pathogenic and cocci as saprophytes. Pathogenic organisms may penetrate the tympanum alone or accompanied with saprophites. If alone, they cause a suppuration analogous to the acute process. If from the beginning they are accompanied with saprophytes, or if these appear later, they find favorable products for their development which are wanting in acute suppuration. At the outset we see none; later a few rods in non-fetid secretion. The rods develop their decomposing properties even though few in number, and feter occurs. At this time the rods, particularly the saprophytic organisms, are present in the cover-glass preparations in large number, but do not develop upon plates in connection with the pathogenic bacteria. Ultimately they overpower the latter, which disappear from the field. In acute otitis media purulenta this condition often requires months for its occurrence. In the chronic form, however, it takes place in but few days. That as a rule in acute suppuration of the middle ear the secretion remains for a long time odorless has been explained by Zaufal in part. As long as the primary excitors of the inflammation retain their full vegetative power, other pathogenic germs are unable to exist at the site of inflammation. It is only when these have lost their vitality the others gain ground. By the destruction of the primary excitors the ground is prepared for the presence of bacteria of putrefaction. It also appears that the normal or abnormal character of the mucous membrane of the tympanum as a nutritive medium for organisms should be taken into consideration, for the vegetative power of pathogenic bacteria which caused the acute recurrence of chronic middle-ear suppuration is certainly not less in the latter than in the acute form. Turning now to the cases of otorrhœa of long standing what strikes us most forcibly is the character of the microscopic preparation. We see all imaginable forms of bacteria in great number lying side by side. What is almost universal is the great preponderance of rods over cocci. The fact is remarkable that plates always gave a very simple

picture, in that usually but one, seldom two and still more seldom three varieties developed.

Even when both ears were diseased, in each side different organisms predominated, as the following cases show :

CASE 12.—L. G., age twenty-one. O. M. P. Chron. of both ears since childhood. At the present time discharge is markedly fetid, profuse, and muco-purulent.

Cover-glass preparations show in the right, diplococci and rods of various lengths. In the left, rods varying in length in great number.

Gelatine plates : in the right, but one variety of colonies, liquefying and fluorescing, composed of short rods. In the left, the plates on the following day were liquefied but showed no fluorescence.

CASE 13.—S., aged twenty-six. Discharge since six years of age, markedly fetid, muco-purulent, moderately profuse.

Cover-glass preparations : right, large number of rods, some comma forms, few cocci, among them some having capsule. Left, fewer rods than in the right, very few cocci.

Gelatine plates : those from the right which were liquefied on the second day exhibited marked fœtor. The rods which were found in the fluid corresponded to those in the cover-glass preparations and presented an unstained portion in the middle. The plates from the left were also markedly fetid. The colonies were liquefying and composed of rods about the size of the typhoid bacilli.

CASE 14.—J. H., aged seventeen. O. M. P. Chron. of both since the fifth year. Moderately profuse, fetid, muco-purulent.

Cover-glass preparations : right, rods of various lengths, very few cocci. Left, rods varying in form and size, occasional comma forms, few cocci.

Gelatine plates : right, colonies of *staphylococcus pyogenes aureus* exceed in number a few non-liquefying colonies of rods. The left plates were liquefied on the following day.

CASE 15.—M. G., aged twelve. O. M. P. Chron. of both.

Cover-glass preparations : in the right, few cocci among numerous rods. Left, fewer bacteria than in the right, rods exceed in number the cocci, large but thinner than those in the right.

Gelatine plates : right, short rods, non-liquefying, about the size of typhoid bacilli, not pathogenic for mice. Left, also non-

liquefying colonies of rods slightly larger than the tubercle bacilli.

CASE 17.—A. F., aged nineteen. O. M. P. Chron. of both ears. Duration of discharge fourteen years. Moderately profuse, muco-purulent, and very offensive.

Cover-glass preparations show : right, rods varying in size, cocci questionable ; left, same appearance.

Gelatine plates : right, grayish, non-liquefying colonies, spreading out over the surface, composed of very small, thin bacilli, similar in every respect to the bacilli of fowl cholera ; left, non-liquefying colonies, closely resembling those of cholera, made up of very thin rods, slightly larger than typhoid bacilli.

CASE 19.—C. S., aged thirty. O. M. P. Chron. of left ear with perforation of Shrapnell's membrane and cholesteatoma. Discharge has existed seventeen years, moderately profuse, but not very fetid.

Cover-glass preparations show numerous bacilli, mainly of one species. Presence of cocci doubtful.

Gelatine plates : a few colonies of large cocci and liquefying colonies of bacilli.

The cultures were fetid.

CASE 20.—M. M., aged twenty-one. O. M. P. Chron. of right since the second year following scarlet fever. Discharge moderately profuse, muco-purulent, and highly offensive.

Microscopic preparation : extraordinary number of staphylococci ; a few rods, short, thick, and some slightly curved. On gelatine as well as agar, staphylococcus pyogenes albus alone grew.

In this case we have either a fresh recurrence of the primary excitors of the disease, or we must assume with Zaufal that the products of the bacteria of putrefaction were favorable to the growth of those pathogenic bacteria still present.

The last stage of otitis media purulenta chronica, characterized by the crusted, thickened, and very fetid nature of the discharge is marked by the simple character of the microscopic picture, which shows in the majority of the cases but one variety of saprophyte.

CASE 21.—J. F. O. M. P. Chron. of both. Discharge cheesy and fetid.

Cover-glass preparations from right ear show bacilli of every possible form, also beautiful vibrios and occasional cocci ; from the left, almost exclusively, fine thin rods, no vibrios, no cocci.

Gelatine plates : right, one form of non-liquefying colonies of thin, short rods, many of which are curved ; left, rapidly-liquefying colonies of very small rods. Plates exceedingly fetid.

CASE 22.—M. E., aged forty. O. M. P. Chron. of right. Markedly foetid inspissated secretion.

Microscopic preparations show principally short rods, slightly curved ; occasional cocci.

Gelatine plates : (a) Non-liquefying colonies of slightly curved rods ; (b) grayish non-liquefying colonies of *straight rods*.

(A few cases of otitis media purulenta phthisica with bacteriological findings are reported here, though really belonging to group 2. They present no points of interest aside from the presence of tubercle bacilli in relatively great number in the discharge.)

Tabulating the bacterial findings, we find :

Known forms.	{	Staphylococcus pyogenes albus, 6 times.
		“ “ aureus, 2 “
		Streptococcus pyogenes, 3 times.
		Bacterium coli commune, 1 time.
Unknown forms.	{	<i>Bacilli :</i>
		<i>Non-liquefying :</i>
		Cultures fetid, 1.
		Cultures not fetid, 9.
		<i>Liquefying :</i>
		Cultures fetid, 4.
		Cultures not fetid, 4.
		<i>Vibrios :</i>
	{	Non-liquefying colonies, 4 times.
		<i>Cocci :</i>
	{	Non-liquefying colonies, 3 times.

Aside from tubercle bacilli, we have failed to find in the secretion from otitis media purulenta chronica any specific exciting organisms differing from those found in the acute form. The presence of saprophytes is alone characteristic of the former.

When anatomical conditions permit the complete removal of the secretion, and all diseased spaces are rendered aseptic, the cessation of suppuration and absence of fetor mark the disappearance of functional activity of the saprophytes, as repeated bacteriological examinations show.

A CASE OF EPITHELIOMA OF THE CARTILAGINOUS AND CUTANEOUS MEATUS AND AURICLE.

BY DR. ALFRED DENKER, OF HAGEN.

(THIRD MEETING OF THE GERMAN OTOLOGICAL SOCIETY, AT BONN, 1894.)

Translated by Dr. A. B. KIBBE, Seattle, Washington.

GENTLEMEN: The patient which I present to you was operated on by me, February 27th of this year. The clinical history and description of the method of operating are as follows :

Mr. H., aged seventy-one, first consulted me December 15, 1891, and stated that he had been operated on for a wart in the left meatus a year ago. Since then a discharge had existed which had been unsuccessfully treated by syringing and insufflations. No history of pain.

Examination revealed an ulcerating surface on the outer half of the cartilaginous meatus about 3 square centimetres in area.

Careful antiseptic treatment producing no improvement in the spring of 1892, the diseased part was thoroughly curetted and cauterized. A few weeks later the patient was discharged, apparently cured.

Unfortunately the cure was only apparent, as he again returned several months later with an ulcer on the inferior wall, which was treated in the same manner.

Up to the end of November, 1893, two recurrences took place.

In February, 1894, the character of the disease had markedly altered. The entire cartilaginous meatus was not only converted into an ulcerated surface which extended forwards and outwards

upon the skin of the helix, but the cutaneous meatus appeared now to participate in the diseased process. The entire auricle was thickened, and the entrance to the meatus narrowed by exuberant granulations. A suspicious nodule having formed in the centre of the anti-helix, and microscopic examination of the granulation tissue rendering the diagnosis of epithelial carcinoma certain, it was clear that amputation of the auricle and removal of the cartilaginous and cutaneous meatus afforded the only prospect of definite cure. The patient, to whom I had explained the necessity for removal of the auricle, at once gave his consent, and the operation was performed, February 27, 1894, in the following manner :

From the lower angle of the junction of the skin of the lobule with that of the cheek an incision was made, extending upward about 5 *cm*. With knife and scissors the anterior wall of the cartilaginous meatus was separated from the bone. A portion of the parotid having a suspicious appearance, was removed. The temporal artery was uninjured. The auricle was then included in an incision extending over the mastoid, about a centimetre posterior to its attachment, as a previous incision close to the insertion of the auricle showed suspicious-appearing tissue. The cartilaginous meatus was then divided at its union with the bony meatus. The cutaneous lining of the latter, which presented an ulcerated surface extending nearly to the drumhead, was thoroughly removed with the sharp spoon. The drumhead itself, as well as the exposed bone appeared completely normal. The wound, almost as large as a saucer, was covered in part by a large skin flap from the vicinity of the parietal bone. From the highest point of the upper border of the wound an incision was carried upward 4 to 5 *cm*, and from the upper end of this a second incision made at right angles to it and of equal length, directed backward. The flap so prepared was loosened from the underlying tissues, drawn downward and forward, and fixed with sutures. The lower edges of the wound were brought together as nearly as possible after a liberating incision downward had been made. An antiseptic dressing was then applied.

In order to cover this large surface as quickly as possible, and to maintain the meatus open, I decided at the outset to resort to transplantation of skin. March 1st a very thin flap, about 2 square centimetres, was transferred to the area exposed by the sliding parietal flap. Under silk protection it united perfectly. As the

balance of the surface of the wound, particularly in its anterior part, did not appear aseptic, further transplantation was deferred for a time.

On changing the dressing, March 3d, the borders of the cutaneous meatus showed profuse granulations, which had a suspicious appearance. Microscopic examination of some ten preparations made from scrapings revealed nothing indicative of carcinoma.

On March 11th, after thorough curetting, everything appearing healthy, two days later the entire surface was covered with Thiersch grafts taken from the patient's left upper arm—four on the bony meatus, and six on the wound surface. Two only of the ten grafts failed to unite, and were cast off,—both from the bony meatus. Complete healing, therefore, took place by granulation and later epithelial formation late in April, while the outer portions of the wound, as well as the bare bone, were firmly covered by the beginning of April. As you see, the meatus is not narrowed, and the drumhead is plainly visible.

A CONTRIBUTION TO THE STUDY OF ACUTE INFLAMMATION OF THE MIDDLE EAR PRODUCED BY THE BACILLUS PYOCYANEUS.

By ORLANDO PES AND G. GRADENIGO, TURIN.

Translated and Abridged by AD. O. PFINGST, M.D., New York.

IT is only in the last years that we have awoke to the real significance of the bacillus pyocyaneus.

Whereas the presence of green pus was, in former years, thought to be indicative only of a localized inflammation, recent researches have shown us that the bacillus pyocyaneus may be classified with those pyogenic germs, capable of producing an infection of the entire organism.

Although we may normally find the bacillus in some of the septic cavities of the body, its presence must nevertheless be looked upon as an exceptional occurrence.

The presence of the bacillus in an abscess, fistula, diarrhœal discharge, etc., is easily recognized by the characteristic color imparted to the pus.

It has frequently been found in the discharge coming from the ear. Maggiora and Gradenigo¹ found it in cultures made from the pus of a furuncle of the ear canal, while Gruber² and Rohrer³ were the first to cultivate it from the discharge of an acute suppurative middle ear. More thorough researches on this subject were published later by Kanthack,⁴ Martha,⁵ and Kossel.⁶

¹ Maggiora et Gradenigo: "Observ. bacter. sur le furoncle du conduit aud. ext."—*Annales de l'Institut Pasteur*, v.

² Gruber, J. *Monatschrift f. Ohrenheilk.*, 1887.

³ Rohrer. *Zur Morphol. der Bacterien des Ohres*, Zurich, 1889.

⁴ Kanthack. *These ARCHIVES*, xxi., 1891.

⁵ Martha. "Note sur deux cas d'otit. m. purulente contenant le bacille pyocyanique à l'état de purté."—*Archives de méd. expériment. et d'anatomie pathol.*, 1892, p. 130.

⁶ Kossel: "Zur Frage der pathogenität des Bacillus pyocyaneus."—*Zeitschrift für Hygiene*, xvi., 1894.

Kossel: "Ueber mittelohreiterungen bei Säuglingen."—*Charité-Annalen*, xviii.

Kanthack found that the bacillus was virulent only when in combination with pathogenic cocci.

We will briefly review two cases in which, among several suppurations of the middle ear following influenza, we were able to make cultures of the bacillus pyocyaneus.

CASE 1.—C.L., a carpenter, thirty-three years old, in whom a supuration of the middle ear of both sides appeared ten days after an attack of influenza. When he came under our observation—twenty days after spontaneous rupture of both drums—the membrana tympani was very much injected. The scanty discharge had a decided green color.

Microscopically we found the pus of both ears to contain, besides the pus corpuscles, bacilli of a uniform size and shape.

Examinations of the pus on subsequent days always revealed the presence of the same micro-organisms.

We isolated the bacillus in beef-tea cultures, carried out under the ordinary precautions, and by its morphological structure recognized the bacillus pyocyaneus.

CASE 2.—B. L., a peasant, fifty-two years of age, whose general condition was very poor. After an attack of influenza, of fifteen days' duration, he experienced a severe pain in his left ear, without any otorrhœa. When we saw the patient, some days later, he still complained of pain in his ear and of deafness.

The drum membrane was intact, but was tense and decidedly injected.

A paracentesis was made, the extruding pus being immediately examined microscopically.

We could only detect cocci, which were of a uniform size, some being arranged in heaps as staphylococci, others in pairs as diplococci, while some isolated ones were scattered about between the pus and epithelial cells.

In beef-tea or plate cultures, on the other hand, we invariably found the bacillus pyocyaneus. To exclude the possibility of their having been introduced from without during our manipulation, we repeated the examination several times. The results were identical. We also took the precaution to close the ear with an aseptic dressing, to exclude it from external contaminations.

Owing to the characteristic properties of the bacillus pyocyaneus its detection is not very difficult.

It imparts a green color to beef tea, at 37°, in twenty-four hours, which increases in intensity in the following days. A delicate tenacious pellicle forms on the surface. After about three months the color changes to an olive green. In the tube cultures the gelatine rapidly liquefies, taking on at the same time a bright greenish-blue color.

At the junction with the unchanged gelatine, a yellowish white crumbling substance is deposited. The color gradually goes over into a bright orange, which by reflected light appears green and opalescent.

New inoculations, made from the culture at this stage, take on the original greenish-blue color.

The gelatine of the plate cultures also liquefies rapidly and takes on a beautiful fluorescence.

On agar the bacilli grow in round colonies, which become surrounded by white or smoky rings, while the entire surface of the agar appears green and opalescent.

While some of the cultures emit a most disagreeable odor, that emanating from the plate cultures is rather pleasant.

In recapitulating briefly we see that the bacillus pyocyaneus is capable of producing an infection of the entire organism. Furthermore that local inflammations produced by the same are frequently found in the ear. The bacillus is always capable, though changed in appearance by artificial culture, of setting up a localized diseased condition.

EXAMINATION OF THE DURATION OF HEARING
THROUGHOUT THE MUSICAL SCALE IN DIS-
EASES OF THE INTERNAL AND MIDDLE
EAR.

By DR. BORIS WERHOVSKY, OF ST. PETERSBURG, RUSSIA.

(With 27 curves on Plates I., II., III., of Vol. XXVIII. of German Ed.)

Translated by Dr. H. A. ALDERTON, of Brooklyn.

WITHOUT considering the diseases of the internal ear, which because of their deep situation are inaccessible to direct investigation, we are unable also in a large number of middle-ear diseases, "without the assistance which the hearing test offers to differential diagnosis, to recognize in many of the cases the character of the affection" (BÜRKNER¹). Above all, in the investigation of the hearing organ, the consideration that the same "offers a peculiarity, which gives it an advantage over the other organs of sense," because in its functional test two ways can be considered by which the sound waves can attain to the perceiving apparatus, namely, both by air conduction and by bone conduction (BEZOLD²).

Insight into the significance of functional examination does not belong exclusively to modern times. On the contrary, the different methods of investigating have occupied for a long time a great number of authors; we owe to them a series of methods of examination which have proved useful for clinical purposes. Concerning the value of physical examination of the ear in general, which recently has been

¹ See Bibliography at end of article.

repeatedly doubted, I like to quote the words of GRADENIGO, that "the errors of the test of the hearing function occurring alone, through the physical qualities of the sources of sound and of the locality of the examination, are limited as compared with the sources of error resulting from the psychical condition of the individual examined; they are so trifling, that we have no cause to complain of the want of greater exactness from the physical standpoint."

HARTMANN⁴ was the first to give graphic representations for a continuous series of tones by air conduction (A. C.) and bone conduction (B. C.), and placed the results of both tests on the diseased ear in juxtaposition for comparison. Hartmann used in his investigation the following forks: c (128 d. v.), c¹ (256), c² (512), c³ (1024), and c⁴ (2048). The normal average duration of hearing for each of these forks in seconds was determined by testing four cases with normal hearing, and the numbers in seconds obtained in hard-hearing people registered graphically, in relative percentages of the time of normal hearing, on the diagram, which is divided into one hundred parts.

Hartmann adduces four types of hardness of hearing from the results obtained:

Type I.—Nearly uniform lowering of the duration of hearing by A. C.

(a) with good hearing through the bones (middle-ear diseases).

(b) with poor hearing through the bones (labyrinth diseases).

Type II.—Bad hearing of the deep, progressively better of the high, tones. Better hearing by B. C. than by A. C., especially for the deep tones (sclerosing processes of the middle ear, especially with ankylosis of the stapes in the oval window and otitis media purulenta residuosa).

Type III.—Good hearing of the deep, progressively poorer for the high, tones. Lowered hearing by B. C., especially for the high tones (in boiler-makers, artillerists, and other pathological processes of the nervous apparatus).

Type IV.—Irregular perception of the different heights of tone, by A. C. as well as by B. C. (where the disease does

not affect the nerve apparatus uniformly throughout, or where there is coincident disease of the sound-conducting apparatus).

GRADENIGO^{*} employed, for the differential diagnosis of the ear diseases, the method of Hartmann with one modification. Besides the tuning-forks, which Hartmann had selected for his investigations, Gradenigo added also tuning-forks C (64) and c⁵ (4096). He ignored entirely the testing of the duration of perception of the individual tones by B. C., and recommended that the time during which the normal ear heard the fork longer than the diseased ear be measured and not the duration of hearing of the patient. The duration of hearing in the diseased ear can then be found by subtraction, the number of seconds so obtained reckoned as usual in percentage to the normal hearing time. The percentage so reckoned Gradenigo represents graphically the same as Hartmann. As a result of his investigations, Gradenigo came to the conclusion that there is found always in diseases of the sound-conducting apparatus a more or less progressive lowering of the acuteness of hearing from the high to the deep tones, and that this is completely reversed in diseases of the internal ear. In diseases of the acoustic nerve, Gradenigo says there is diminished perception for the middle tones, whilst the perception for the high tones is relatively well maintained.

Gradenigo's modification of Hartmann's method does not depend upon the intensity of the stroke given to the tuning-fork, and this is a great advantage over Hartmann's method; also, as a result, the perceiving apparatus is less exhausted.

BEZOLD^{*} has already used this method for years.

If it is in one way an advantage that Gradenigo needs more tuning-forks than Hartmann, it is in other ways incomprehensible why he completely ignored the testing of the duration of perception of the different tones. In another article GRADENIGO^{*} writes that such a testing "inclines to too many complicative factors." The execution of this test with very deep and very high tuning-forks is certainly practically an impossibility, the patient being hardly able to differentiate between the feeling of the mechanical vibration

of the deep tuning-fork when in place and the perception of its tones; with the high tuning-forks "already with forks above a² the isolation of the B. C. will not admit of proof, these forks being so intense and their rhythm being audible to such a distance through the air, that it is impracticable to exclude the A. C." (BEZOLD³). But in no case are we authorized to deem the testing by B.C. with forks of middle register superfluous. From the numerous writings of Bezold and from my own investigations it follows that very important and very instructive results, bearing upon the differential diagnosis of ear diseases, are obtained through the determination of the duration of perception of the tuning-fork of middle register by B. C., and the comparison of the same with that by A. C.

Very recently, ALDERTON⁴ has published very extensive investigations as to the duration of perception of different tones by A. C. and B. C. He used in his examinations Hartmann's series of tuning-forks. The difference of his method from that of Hartmann consists only in the fact, that he denotes the duration of perception of the different tones by the number of seconds during which the patient perceived the tone of each fork when in position. It is to be regretted that Alderton did not present the results obtained by him according to the graphic percentages of Hartmann. Alderton himself gives no reason for this innovation; he only says that to him the method of Hartmann appears "to be too difficult and misleading," and "every investigator learns quickly the normal re-actions of his own tuning-fork set, and can then use it easily for comparison." Yet it appears to me that the rich material obtained by Alderton would have gained in value if he had presented the same according to Hartmann's method, for only in the latter way a direct comparison of the results is possible.

If one puts the forks in vibration with free hand, one can never be sure that every time a uniform strength of stroke is obtained. And this is a source of error also in the original method of Hartmann. This error by maximum stroke of the fork can be almost quite neglected, but it is quite another thing with the sort of stroke used in the investiga-

tion by Alderton, who compares the tone produced "through a light stroke upon the bent knee," with the result "of a c^4 fork put in vibration through a stroke on a thick piece of rubber." Thereby is also explained perhaps the apparent contradiction, noticeable in some numbers, in so far as many patients of Alderton heard one and the same tone (c^1) better through the air than the thirty-six men who had "absolutely normal ears." While we also know that since the investigations of Bezold and of Schwabach, that an increase of B. C. is returned as a regularly constituted symptom in certain diseases of the ear, so it is yet hardly possible in any case to say the same of the increase of A. C. One could always think here of a hyperæsthesia of the acoustic. It is very doubtful, however, that the hyperæsthesia itself should always be limited in all patients to one and the same tone (c^1) only.

Bezold has up to the present in his clinical investigations considered mostly only the lower- and upper-tone limits, the existence or absence of A. C. in the course of the scale, and the duration of B. C. for individual tuning-forks (A, a, a^1). In answer to the long-expressed wish of Bezold, that also an exact determination of time of A. C. for the whole course of the tone series be obtained in a great number of cases, I have completed in this direction the functional investigation of a great number of patients.

All cases submitting to my investigation were first functionally tested by Bezold, or, as occurred in four cases (2, 6, 13, and 20), by his assistant, Dr. Arno Scheibe, in order to determine the diagnosis, and then kindly turned over to me for further testing. Moreover, I selected, as suggested by Bezold, with one exception (Case 27), only typical cases for my examination, *i.e.*, only such as presented one form of disease and not a combination of diseases. I have examined twenty-six typical cases, eleven of sclerosis of the sound-conducting apparatus, fourteen of disease of the sound-perceiving apparatus, and one of traumatic rupture of the tympanic membrane. In one case there was found, besides a bilateral disease of the internal ear, a depressed cicatrix upon one side from a previous middle-ear suppuration.

Concerning the functional testing of the diseased ear the reader is referred to "*Survey of the Present Condition of Otol-ogy*," by Bezold,¹⁰ in which the foregoing is exactly pre-sented.

I have employed Hartmann's method, as did Gradenigo, not in its original form, but with the following modifica-tion. For measuring the duration of perception of the dif-ferent tones I did not use Hartmann's series, which consists only of five tuning-forks, but the following nine tuning-forks :

A ²	26.66	d. v. s.	(double vibrations a second).
A ¹	53.33	" "	
A	106.66	" "	
a	213.33	" "	
a ¹	426.66	" "	
a ²	853.33	" "	
f ²	1365.28	" "	
c ²	2018	" "	
fis ⁴	11,000	" "	

For the determination of the duration of perception by B. C., I limited myself to three tones of middle register, and therefore used only the tuning-forks A, a, and a¹. To ex-press in seconds the duration of perception of the patient for the different tones conducted from the vertex, I found out, as Bezold has always done since the beginning of his tuning-fork experiments, not the total time during which the tone of the fork was perceived by the patient, but just the difference between the duration of B. C. for the patient and for the observer. If the tone of the tuning-fork was not again heard when instantly placed upon the vertex of the ob-server, after having died out while on the vertex of the patient, then the difference between the investigator and investigated = 0, and the duration of B. C. was indicated with 1.0, *i. e.*, normal. If the duration of B. C. in the investi-gated person was shorter, its value was less than 1.0, and in the opposite case greater than 1.0. The decimals, accord-ing to our own duration of B. C., are indicated for each tuning-fork. In the same way in testing the A. C., the time

during which the tuning-fork was heard longer by the investigator than by the patient was compared with the duration of hearing for the same tuning-fork by our own normal ear, and the impairment of hearing in percentage of my own duration of hearing indicated. For example, if the A-fork, its tone having been elicited by a strong stroke, is held nearly in touch with the auricle, and is perceived by me for eighty seconds long, and is heard by me forty seconds longer than by the patient, then the duration of hearing for the patient for the same tone was also forty seconds, and his relative percentage to the normal duration of hearing is calculated after the following simple formula :

$$40 : 80 = x : 100.$$

$$x = 50 \%$$

In like manner was calculated the percentage of the duration of the B. C. of the patient to the normal, only the normal value of the latter was indicated as 1.0 and not as 100.0.

Each measurement was several times repeated, and every time the average of the collective measurements stated.

After many trials the duration of hearing of my own ear for each tuning-fork was provisionally fixed. Through A. C. I heard :

The tuning-fork A³ 60 seconds.

A ¹	75	"
A	80	"
a	80	"
a ¹	100	"
a ³	114	"
f ³	75	"
c ⁴	75	"
fis ⁴	22	"

From the vertex I perceived the tone of the

A fork 24 seconds.

a	"	20	"
a ¹	"	12	"

The duration for each tuning-fork measured by A. C. as well as B. C. is presented graphically for each individual case in Tables I-III.

CASES.

Sclerosis of the Sound-Conducting Apparatus.

CASE 1, No. 554.¹—Theresa F., fifty-four years old. For four years gradually increasing hardness of hearing, at times tinnitus and vertigo. A brother is hard of hearing through the use of explosives—*Mt*: right, normal; left, slightly diffusely thickened.

Whisper, $\left\{ \begin{array}{l} \text{right, } 7 \text{ m,} \\ \text{left, } 30 \text{ cm.} \end{array} \right.$

Lower tone limit, $\left\{ \begin{array}{l} \text{right, } 19.5 \text{ d. v. s. (the deepest tone} \\ \text{tested).} \\ \text{left, } G^1. \end{array} \right.$

"A" fork upon vertex in poorer left ear + 17 seconds,
 "a¹" " " " " " " " + 7 "

Rinné a¹, $\left\{ \begin{array}{l} \text{right, } + 20 \text{ seconds,} \\ \text{left, } - 14 \text{ " } \end{array} \right.$

Edelmann-Galton Whistle,² $\left\{ \begin{array}{l} \text{right, } 1.1, \\ \text{left, } 1.3. \end{array} \right.$

Catheterization on the left side penetrates with a moderately strong, continuous, smooth stream, and did *not* improve,

CASE 2, No. 530.—Anna W., twenty-one years old. For two years headache, for one year constant tinnitus, for nine months hardness of hearing noticed on right side. No vertigo, no heredity. Both *Mt* somewhat less transparent, right periphery more markedly thickened, otherwise normal. Right nasal fossa narrowed by deviation of the septum; left inferior and middle turbinates hypertrophied anteriorly. On the right tube mouth above a small, yellowish protuberance; otherwise no changes of the tube mouths.

Whisper, $\left\{ \begin{array}{l} \text{right, } 6 \text{ m ("drei" and "neun").} \\ \text{left, } 7 \text{ m.} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } F, \\ \text{left, } 21 \text{ d. v. s.} \end{array} \right.$

"A" fork heard from vertex in diseased ear + 13 seconds.
 "a¹" " " " " " " + 5 "

Rinné a¹, $\left\{ \begin{array}{l} \text{right, } + 8 \text{ seconds,} \\ \text{left, } + 31 \text{ seconds.} \end{array} \right.$

E. G. Whistle, both sides, 1.2.

¹ The numbers refer to the Dispensary journal of the year 1895.

² Usually heard in the normal ear at 1.1.

for one year, and hardness of hearing; no heredity; at times vertigo.

Examination in 1893. Both *Mt* normal. Catheterization penetrated right in indistinct, left in weak continuous stream, but did not improve hearing.

Whisper, $\left\{ \begin{array}{l} \text{right, 20 cm ("funf"),} \\ \text{left, 18 cm ("neun").} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, F,} \\ \text{left, D.} \end{array} \right.$

"A" fork upon vertex + 17 seconds.

"a¹" " " + 5 "

Rinné a¹, $\left\{ \begin{array}{l} \text{right,—8 seconds,} \\ \text{left,—7 seconds.} \end{array} \right.$

Examination in 1895, the right *Mt* in posterior half slightly diffusely reddish, transparent.

Whisper, $\left\{ \begin{array}{l} \text{right, 18 cm ("funf" and "neun").} \\ \text{left, 20 cm ("vier" and "sechs").} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, F,} \\ \text{left, H,} \end{array} \right.$

B. C. and Rinné's test as in 1893. E. G. whistle, both sides, r. r.

Catheterization penetrated in right in moderate, left in weak continuous stream; the hearing on the right was not changed, the left was made worse for the whisper to 15 cm.

CASE 6, No. 537.—Anna J., thirty-four years old. Hardness of hearing for one year; tinnitus, no dizziness, no heredity. Both *Mt* typically normal.

Whisper, $\left\{ \begin{array}{l} \text{right, 65 cm ("neun"),} \\ \text{left, 40 cm ("neun").} \end{array} \right.$

Last year the hearing for the whisper was: right, 30 cm ("acht"); left, 35 cm ("neun"). The hearing was improved to the above degree after a month's visit to the mountains.

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, G}_1, \\ \text{left, C}_1. \end{array} \right.$

"A" fork upon vertex + 10 seconds.

"a¹" fork upon vertex ± 0 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right,—8 seconds,} \\ \text{left,—10 seconds.} \end{array} \right.$

E. G. Whistle, both sides, r. r.

Catheterization penetrated on right side in weak, on left in moderate continuous stream. Paracosis Willisii.

CASE 7, No. 391.—Erwin N., twenty-two years old. Noticed hardness of hearing in the winter of last year. That gradually disappeared of itself. Hardness of hearing again appeared for past two months, without tinnitus, vertigo, or heredity. Both *Mt* normal; on left a light reflex, showing convexity in the upper posterior periphery. The tube mouths unchanged, except for a large vessel on each side, which ran along the inner wall of the mouth of the tube. Moderate quantity of adenoid vegetations on the naso-pharyngeal roof, without irregularities.

Whisper, $\left\{ \begin{array}{l} \text{right, } 7 \text{ m } <, \\ \text{left, } 60 \text{ cm ("vier" and "sechs").} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } 19\frac{1}{2} \text{ d. v. s. (the lowest tone tested),} \\ \text{left, } \text{Gis}_1. \end{array} \right.$

"A" fork upon vertex in the poorer left ear + 4 seconds,

"a¹" fork upon vertex in the poorer left ear, ± 0 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, } + 23 \text{ seconds,} \\ \text{left, } - 7 \text{ seconds.} \end{array} \right.$

E. G. Whistle, both sides, 1.1.

Catheterization penetrated left in moderate stream, without change.

CASE 8, No. 501.—Josefine P., twenty-six years old. Tinnitus for two years; no dizziness. Mother is hard of hearing. Both *Mt* typically normal. Pharyngeal tube mouths strikingly small; otherwise unchanged.

Whisper, $\left\{ \begin{array}{l} \text{right, } 10 \text{ cm ("neun")}, \\ \text{left, } 25 \text{ cm ("neun").} \end{array} \right.$

Lower-tone limit, both sides, F₁.

"A" fork upon vertex in the poorer right (uncertain) + 12 seconds.

"a¹" fork upon vertex in the poorer right (uncertain) — 3 seconds.

Rinné a¹, both sides, — 9 seconds.

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, } 1.1, \\ \text{left, } 1.2. \end{array} \right.$

Catheterization penetrated with strong continuous stream, without perceptible improvement.

CASE 9, No. 396.—Max S., fifty-two years old. Hard of hearing since 1870. For three years constant tinnitus; no dizziness, no heredity. Both *Mt* typically normal.

Whisper, $\left\{ \begin{array}{l} \text{right, } 3 \text{ cm ("vier" and "acht")}, \\ \text{left, uncertain.} \end{array} \right.$

Lower-tone limit, both sides, F.

"A" fork upon vertex (Weber experiment unusable), + 11 seconds.

"a¹" fork upon vertex (Weber experiment unusable) ± 0 seconds.

Rinné a¹, { right, — 9 seconds,
left, — 12 seconds.

E. G. Whistle, { right, 1.1,
left, 1.2.

Catheterization penetrated on both sides in moderate continuous stream, without perceptible improvement.

CASE 10, No. 432.—Monika B., forty-seven years old. Tinnitus at times for two years, and hardness of hearing on the right side. Both *Mt* slightly diffusely thickened. Otherwise normal. No dizziness; father hard of hearing.

Whisper, { right, 6 cm ("vier"),
left, 4 m ("sechs" and "sieben").

Lower-tone limit, { right, E,
left, d. v. s.

"A" fork upon vertex in the poorer right + 6 seconds.

"a¹" " " " " " " — 2 seconds.

Rinné a¹, { right, — 11 seconds,
left, + 17 seconds.

E. G. Whistle, { right, 1.4,
left, 1.1.

Catherization penetrating in a continuous stream.

CASE 11, No. 387.—Iwan W., thirty-two years old. Deafness for speech for eight years, constant tinnitus. Both *Mt* of normal conformation, right diffusely reddened in the whole anterior half, and in the posterior inferior quadrant.

Conversational speech, { right, most of the Russian numbers
were understood.
left, deafness for speech.

Lower-tone limit, { right, fis¹, by all the tuning-forks up to fis⁴
inclusive.¹
left, only fis⁴ heard of all the tuning-forks.

"A" fork upon vertex uncertain as to which ear, + 7 seconds.

"a¹" " " " " " in right (only upon strong stroke) — 12 seconds.

¹ The unclamped a¹ fork was only heard one moment per air, and therefore it does not appear in the graphic presentation.

They were better heard on the mastoid process.

Rinné a¹, { right, — 12 seconds,
 { left, — 12 seconds.

E. G. Whistle, { right, 2.9,
 { left, 6.2.

Blowings (?) on the whistle not heard on either side. Both f⁶ and f⁸ organ pipes were well heard on the right side, left lower-tone limit in the organ pipe g⁴.

Nerve Deafness.

CASE 12, No. 487.—Joseph N., ten years old. Hardness of hearing for six months, especially on the right side. No heredity, no dizziness, at times tinnitus. Both *Mt* typically normal. Eyes and teeth normal. Healthy appearance.

Whisper, { right, 8 cm ("vier" and "funf"),
 { left, 18 cm ("vier").

Lower-tone limit, both sides, 16 d. v. s.

"A" fork upon vertex better in the left — 13 seconds.

"a" " " " " " " — 12 seconds.

"a¹" " " " not heard.

Rinné a¹, { right, + 26 seconds,
 { left, + 16 seconds.

E. G. Whistle, { right, 1.1,
 { left, 1.2.

Catheterization penetrated on both sides in continuous moderate stream, without altering hearing range.

CASE 13.—Johann R. (examined by Dr. Scheibe), forty-seven years old. In the railway service for thirteen years; hit on the left ear ten years before; yet patient neither at that time nor since has noticed that he is hard of hearing. Tinnitus and dizziness are absent. Both *Mt* normal.

Whisper, { right, 5 m } (both sides "fünf," "sechs," and
 { left, 60 cm } "sieben".)

Lower-tone limit, both sides, 16 d. v. s.

"A" fork upon vertex better in right, — 2 seconds.

"a¹" " " " " " " — 6 seconds.

Rinné a¹, { right, + 19 seconds,
 { left, + 21 seconds.

E. G. Whistle, both sides, 1.1.

Catheterization penetrated both sides in moderate normal stream, without improvement.

CASE 14, No. 513.—Leopold S., forty-three years old. Constant tinnitus on left side for one year. No heredity, no dizziness. Patient noticed hardness of hearing for six months. Both *Mt* moderately diffusely thickened. Manubrium broadened.

Whisper, $\left\{ \begin{array}{l} \text{right, } 2 \text{ } m \text{ ("fünf" und "sieben")}, \\ \text{left, } 2\frac{1}{2} \text{ } m \text{ ("sieben")}. \end{array} \right.$

Lower-tone limit, both sides 19.5 d. v. s. (deepest tested tuning-fork.

"A" fork upon vertex + 0 seconds,

"_a¹" " " " — 9 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, + 26 seconds,} \\ \text{left, + 28 seconds.} \end{array} \right.$

E. G. Whistle, both sides, 1.1.

CASE 15, No. 320.—Joseph Z., eleven and three-fourth years old. Measles about four years before, since then hardness of hearing, but did not perceptibly increase. Both sides posteriorly, strands of thickening, and on right diffuse thickening of the *Mt*, with the exception of the anterior superior quadrant; above the right short process a small light reflex.

Whisper, $\left\{ \begin{array}{l} \text{right, } 40 \text{ } cm \text{ ("vier," "acht")}, \\ \text{left, } 30 \text{ } cm \text{ ("acht")}. \end{array} \right.$

Lower-tone limit, both sides, 16 d. v. s.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, + 15,} \\ \text{left, + 17.} \end{array} \right.$

E. G. Whistle, both sides, 1.1.

CASE 16, No. 448.—Johann S., fifty-four years old. Locomotive engineer for thirty years. Hardness of hearing for three years, beginning gradually and then remaining stationary. No tinnitus, no dizziness, no heredity. Both *Mt* typically normal.

Whisper, $\left\{ \begin{array}{l} \text{right, } 10 \text{ } cm \text{ ("vier," "neun")}, \\ \text{left, } 12 \text{ } cm \text{ (" " " ")}. \end{array} \right.$

Lower-tone limit, both sides, 27 d. v. s.

"A" fork upon vertex, — 10 seconds.

"a" " " " — 15 seconds.

"_a¹" " " " not heard, nor from the mastoid process.

Rinné a¹, both sides, + f.

E. G. Whistle, both sides. 1.1.

CASE 17, No. 482.—Christian R., thirty-seven years old. For two years constant tinnitus on the left side, occasional tinnitus on

the right; the left was very loud and described as a waterfall. For three months attacks of dizziness, so that he must hold on to something, and vomiting. No heredity. Both *Mt* normal, left hammer somewhat more horizontal. In the last week an attack of psychosis.

Whisper, $\left\{ \begin{array}{l} \text{right, } 1\frac{1}{2} \text{ m,} \\ \text{left, } 2 \text{ cm.} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } D_1, \\ \text{left, } G_1. \end{array} \right.$

"A" fork upon vertex in better right, — 8 seconds.

"a¹" fork neither upon vertex nor on mastoid process heard.

Rinné a¹, both sides, + 2.

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, } 1.1, \\ \text{left, } 1.2. \end{array} \right.$

Catheterization penetrated both sides in moderately continuous streams.

CASE 18, No. 464.—Fanny M., forty-nine years old. Cerebral syphilis, weakness of memory, eruption. When patient was a little girl, one child in the family, as also her mother, had syphilis. At times tinnitus, continuous disturbance of co-ordination. The right *Mt* showed an irregular circumscribed dark spot in the posterior half, otherwise normal. Left manubrium somewhat broadened. Strands of thickening posteriorly, with prominent posterior fold.

Whisper, $\left\{ \begin{array}{l} \text{right, } 35 \text{ cm,} \\ \text{left, } 3 \text{ cm.} \end{array} \right\}$ both sides "fünf."

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } 21 \text{ d. v. s.,} \\ \text{left, } 22.5 \text{ d. v. s.} \end{array} \right.$

"A" fork upon vertex in the left ± 0 .

"a" fork upon vertex in the left — 14.

"a¹" fork upon vertex not heard.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, } + t, \\ \text{left, } + 17 \text{ seconds.} \end{array} \right.$

E. G. Whistle, both sides, 1.2.

Catheterization penetrated left side in indistinct stream.

CASE 19, No. 477.—Johann R., seventy years old. Afflicted with hardness of hearing at least one and a half years. At times tinnitus, dizziness on blowing the nose, no heredity. Ardent gunner and target shooter. Both *Mt* normal.

Whisper, $\left\{ \begin{array}{l} \text{right, } 15 \text{ cm ("sieben"),} \\ \text{left, } 2 \text{ cm (all members apparently alike).} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, 25 d. v. s.} \\ \text{left, 22 d. v. s.} \end{array} \right.$

"A" fork upon vertex uncertain in which, — 8 seconds.

"a¹" fork upon vertex in the right, — 10 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, + 24 seconds.} \\ \text{left, } \pm 0 \text{ seconds.} \end{array} \right.$

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, 3 6,} \\ \text{left, 2 9.} \end{array} \right.$

CASE 20. No. 559—B. K., thirty-six years old. Two years before, bursting of gun, after which temporary singing and since then slight hardness of hearing on the right side. More marked hardness of hearing and constant singing on both sides for three months. No dizziness, no heredity, both *Mt* slightly diffusely thickened. Both reflexes only intensified.

Whisper, $\left\{ \begin{array}{l} \text{right, 2 cm,} \\ \text{left, 8 cm,} \end{array} \right\}$ all numbers the same.

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, 25 d. v. s.} \\ \text{left, 19.5 d. v. s. (lowest tested tone).} \end{array} \right.$

"A" fork upon the vertex, — 7 seconds.

"a¹" fork upon the vertex not heard.

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, 1.2,} \\ \text{left, 1.1.} \end{array} \right.$

Catheterization penetrated right in broad, left in moderately normal stream, without improvement.

CASE 21, No. 504.—Joseph Z., thirty-three years old. For two years, after use of salicylates, dizziness, and tinnitus. Both *Mt* diffusely thickened and without reflexes. Formerly had occasional, now constant dizziness. Yesterday a more marked attack of vertigo.

Whisper, $\left\{ \begin{array}{l} \text{right, 15 cm ("sieben").} \\ \text{left, uncertain.} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, 25 d. v. s.} \\ \text{left, G}_1. \end{array} \right.$

"A" fork upon vertex in the better ear, — 7 seconds.

"a¹" fork upon vertex in the better ear, — 5 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, + 23 seconds.} \\ \text{left, } \pm 0 \text{ seconds.} \end{array} \right.$

E. G. Whistle. $\left\{ \begin{array}{l} \text{right, 1.1,} \\ \text{left, 5 6.} \end{array} \right.$

Catheterization penetrated right with moderate, left in strong continuous stream, without improvement. Therapy: pot. iod.

CASE 22, No. 516.—Michael D., twenty-five years old. Hardness of hearing for two years, tinnitus for one year, no dizziness. Uncle on maternal side hard of hearing. In 1891, a gun was shot off beside his left ear. Both *Mt* slightly diffusely red and translucent. Thickening of the intermedial zone upon the left side.

Whisper, { right 8 *cm* ("funf" "seben"),
 { left uncertain ("vier").

Ordinary conversation, left, 3½ *m*. ("drei").

Lower-tone limit, both sides, 19.5 d.v.s. (the deepest tested tone).

"A" fork upon vertex (Weber test unusable) — 5 seconds.

"a¹" fork upon vertex (Weber test unusable) — 8 seconds.

Rinné a¹, { right, + 24 seconds,
 { left, + 10 seconds.

E. G. Whistle, { right, 3.7,
 { left, 3.4.

CASE 23, No. 483.—Magdalena G., seventy-eight years old. Marked impairment of hearing for five to six years. No heredity, at times tinnitus, formerly (ten to eleven years ago) marked dizziness, so the patient must hold on something. Right *Mt* strands of thickening posteriorly with prominences of the posterior fold. Thickening of the intermedial zone. Left *Mt* the same. Hearing trumpet does not improve the hearing.

Whisper, { right, 3 *cm* ("sieben"),
 { left, uncertain, (excepting "sieben").

Ordinary conversation, { right, 60 *cm* ("neun" and "sieben")
 { left, 20 *cm* ("fünf").

Lower tone limit, { right, G¹,
 { left, F¹.

"A" fork upon vertex uncertain in which — 10 seconds.

"a" and "a¹" forks not heard upon vertex or mastoid.

Rinné a and a¹, both sides, + t.

E. G. Whistle { right, 6.5,
 { left, 7.4, no hiatuses.

Catheterization penetrated right in continuous stream, left not distinctly audible.

CASE 24, No. 443.—Marie G., eighteen years old. Hardness of hearing suddenly appearing five years before. A sister is hard of hearing. On left side constant tinnitus, occasional dizziness and considerable headache. Both *Mt* normal.

Whisper, { right, 3 *cm* ("drei", "vier" and "sieben"),
left, not heard.

Conversational speech, { right, 10 *cm*. (All numbers apparently
alike.)
left, not heard, also did not hear
shouted words.

Lower-tone limit { right, 27 d. v. s.
left, only *c*⁴ strongly struck and *fis*⁴ moder-
ately struck.

In the organ pipes lower-tone limit *b*³.

"A" fork upon vertex in the better right ear, — 5 seconds.

"a" fork upon vertex in the better right ear, — 9 seconds.

"a¹" fork upon vertex not heard.

Rinné *a*¹, { right, + *t*,
left, could not be tested.

E. G. Whistle, { right, 2.9,
left, 4.6.

Right heard the blowing, left not heard.

CASE 25, No. 564.—Notburga H., thirty-four years old. Examination March 3, 1893, whisper both sides 2 *m* ("neun").

Both *Mt* show a fold running directly backwards from the short process with opaque stripes, more marked on the left side. Left shows two small extravasations of blood, one in front of the short process, the other in the posterior superior periphery; otherwise both *Mt* are normal. No heredity. Tinnitus in right since October and in the left since Christmas. Vertigo also for the same time, constant for the past fourteen days. Simultaneously headache.

Catheterization, accomplished in a sitting posture, penetrated both sides, in moderate continuous stream, only that the patient reeled or complained of marked subjective vertigo, without improvement. The patient goes about heavily but no staggering was noticed. Medication: quinine.

Dec., 3d.—The tinnitus assumed another character since the administration of quinine, without becoming perceptibly stronger. Because of inclination to vomit the patient cannot remain long out of bed. In place of the blood extravasation in the posterior superior periphery appears to-day a small atrophic spot.

Whisper, { right, 2 *m*,
left, 1 *m*.

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } A_1, \\ \text{left, } D. \end{array} \right.$

"A" fork upon vertex ± 0 .

"a" and "a¹" forks heard neither on vertex nor mastoid.

Examination, Aug. 23, 1895.—After lasting half a year all troubles vanished and also the hearing became better. Eight days before, vertigo appeared with vomiting, tinnitus, and hardness of hearing. Condition of *Mt* the same as in 1893.

Whisper, $\left\{ \begin{array}{l} \text{right, } 80 \text{ cm ("acht ")} \\ \text{left, } 4 \text{ m (uncertain statement).} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } C, \\ \text{left, } A_1 \text{ (sharply limited).} \end{array} \right.$

"A" fork upon vertex in the better left — 17 seconds,

"a¹" fork upon vertex in the better left — 8 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, } + 8 \text{ seconds (upon right mastoid heard in} \\ \text{the left),} \\ \text{left, } + 23 \text{ seconds.} \end{array} \right.$

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, } 1.2, \\ \text{left, } 1.2. \end{array} \right.$

Aug. 25, 1895.—

Whisper, $\left\{ \begin{array}{l} \text{right, } 80 \text{ cm ("acht ")} \\ \text{left, } 6 \text{ m } < \end{array} \right.$

Catheterization penetrated on right in thin, on left in broad continuous stream, with improvement on the right to $1\frac{1}{4}$ m.

Sept. 3, 1895.—

Whisper, $\left\{ \begin{array}{l} \text{right, } 1\frac{1}{4} \text{ m,} \\ \text{left, } 6 \text{ m.} \end{array} \right.$

Gellé's test upon vertex with "A" fork positive on both sides.

Traumatic Rupture of the Mt.

CASE 26, No. 584. — Joseph J., twenty-seven years old. Patient was struck twelve years before on the right ear by a fragment of a wood hammer, after which he was dazed for a moment. On the day of the injury he became also hard of hearing, nominally bilateral. A couple of days later moderate tinnitus appeared, which still persists. No vertigo. On blowing the nose air penetrated through the right ear. Patient has allowed the water to flow into the ear every day, in spite of which no discharge has appeared. Left *Mt* normal, right exhibits an irregularly shaped extravasation running from the anterior superior to the posterior inferior quadrant, in whose anterior portion in the anterior superior quadrant lies a sharply limited circular perfora-

tion of about 1 mm in diameter. In the inferior anterior quadrant of the *Mt* a white strand of thickening, concave anteriorly.

Whisper, $\left\{ \begin{array}{l} \text{right, 1 } m \text{ ("funf")}, \\ \text{left, 7 } m < \text{ ("hundert")}. \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } F_1, \\ \text{left, d. v. s.} \end{array} \right.$

"A" fork upon vertex in diseased right + 20 seconds,

"a" fork upon vertex in diseased right + 10 seconds,

"a¹" fork upon vertex in diseased right + 7 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, + 15 seconds,} \\ \text{left, + 25 seconds.} \end{array} \right.$

E. G. Whistle, both sides, 1.1.

The air penetrated by Politzer's and Valsalva's experiments, in deep blowing continuous stream.

Bilateral Nerve Deafness.

With cicatrix in right, the result of a middle-ear suppuration cured in childhood.

CASE 27, N^o. 592.—N. G., thirty-one years old. Discharged, for about three months, in his sixteenth year. Hardness of hearing for about ten years, occasional tinnitus, no dizziness, no heredity. Right side, small lentil-sized thin circular cicatrix in the anterior inferior quadrant; left, rather marked thickening in the intermedial zone (perhaps likewise the result of a former middle-ear suppuration). The cicatrix is sharply defined, transparent, and moves very easily, as does also the whole *Mt* on rarefaction of the air in canal by means of the Delstanche raréfacteur.

Whisper, $\left\{ \begin{array}{l} \text{right, 90 } cm \text{ ("sieben" "acht")}, \\ \text{left, 1 } m \text{ ("sieben" "acht")}. \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } Des_1, \\ \text{left, } 19\frac{1}{2} \text{ d.v.s. (the deepest tested tone).} \end{array} \right.$

"A" fork upon vertex in the right — 8 seconds,

"a¹" fork upon vertex in the right — 5 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, + 19 seconds,} \\ \text{left, + 29 seconds.} \end{array} \right.$

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, 2.9,} \\ \text{left, 2.7.} \end{array} \right.$

Catheterization penetrated both sides in moderate stream; no real change.

All the examined cases are placed together in review in the following table according to the age, severity, history, and the results of the objective investigation.

TABLE.

No.	DISEASE.	SEX.	AGE.	ETIOLOGY.	Hereditary.	Tinnitus.	Vertigo.	WARRER'S TEST.	Perception by B. C. ¹	RIGHT.				LEFT.			
										Whisper.	Lower-tone Limit.	Rinne Test.	Upper-tone Limit.	Whisper.	Lower-tone Limit.	Rinne Test.	Upper-tone Limit.
1	Sclerosis.	Female.	54	—	—	—	—	In poorer.	+ 17 sec.	7 m >	19.5 d. v.	+ 20 sec.	1.1	30 cm	G ₁	+ 14 sec.	1.3
2	"	"	21	—	—	—	—	In both alike.	+ 13 "	6 m	F ₁	+ 8 "	1.2	7 m <	21.0 d. v.	+ 31 "	1.2
3	"	Male.	27	—	—	—	—	In poorer.	+ 12 "	20 cm	G ₁	+ 7 "	1.1	20 cm	F ₁	+ 11 "	1.1
4	"	Female.	32	—	—	—	—	In both alike.	+ 15 "	25 "	G ₁	+ 8 "	1.2	35 "	D ₁	+ 9 "	1.1
5	"	Female.	49	—	—	—	—	" " "	+ 17 "	20 "	G ₁	+ 8 "	1.1	18 "	C ₁	+ 7 "	1.1
6	"	Female.	34	—	—	—	—	" " "	+ 10 "	65 "	19.5 d. v.	+ 23 "	1.1	40 "	G ₁	+ 7 "	1.1
7	"	Male.	22	—	—	—	—	In poorer.	+ 4 "	7 m <	19.5 d. v.	+ 23 "	1.1	25 "	Uncertain.	+ 9 "	1.1
8	"	Female.	26	—	—	—	—	" " "	+ 12 "	10 cm	F ₁	+ 9 "	1.1	35 "	F ₁	+ 9 "	1.2
9	"	Female.	52	—	—	—	—	Useless.	+ 11 "	3 "	E	+ 9 "	1.4	4 m	E	+ 17 "	1.2
10	"	Female.	47	—	—	—	—	In poorer.	+ 7 "	8 cm	65 "	+ 26 "	1.2	18 cm	16 d. v.	+ 16 "	1.2
11	"	Male.	32	—	—	—	—	Useless.	+ 6 "	Only conversation.	16 d. v.	+ 26 "	1.1	60 "	16 d. v.	+ 23 "	1.1
12	Nerve deafness.	"	10	—	—	—	—	In better.	+ 0 "	5 m	16 d. v.	+ 26 "	1.1	2.5 m	19.5 d. v.	+ 28 "	1.1
13	"	"	47	—	—	—	—	" " "	+ 9 "	40 cm	10.5 d. v.	+ 15 "	1.1	30 cm	10.5 d. v.	+ 17 "	1.1
14	"	"	43	—	—	—	—	Useless.	+ 0 "	10 "	27 d. v.	+ 15 "	1.1	2 "	27 d. v.	+ 17 "	1.1
15	"	"	12	Meeses.	—	—	—	In both alike.	+ 0 "	1.5 m	D ₁	+ 15 "	1.1	3 "	G ₁	+ 17 "	1.2
16	"	"	54	—	—	—	—	In better.	+ 0 "	35 cm	21 d. v.	+ 24 sec.	1.2	3 "	22.5 d. v.	+ 17 "	1.2
17	"	"	37	—	—	—	—	In poorer.	+ 10 "	15 "	25 d. v.	+ 24 sec.	3.6	2 "	22.5 d. v.	+ 17 "	1.2
18	"	Female.	49	Syphilis.	—	—	—	Uncertain.	+ 0 "	15 "	25 d. v.	+ 24 sec.	1.2	8 "	19.5 d. v.	+ 27 "	1.1
19	"	Male.	70	Gunning.	—	—	—	In both alike.	+ 0 "	15 "	25 d. v.	+ 24 sec.	1.1	Uncertain.	19.5 d. v.	+ 27 "	1.1
20	"	"	36	Explosion.	—	—	—	In better.	+ 8 "	8 "	19.5 d. v.	+ 24 sec.	3.7	Uncertain.	19.5 d. v.	+ 27 "	1.1
21	"	"	33	Salicyl.	—	—	—	Useless.	+ 0 "	3 "	F ₁	+ 24 "	6.5	"	G ₁	+ 24 "	4.6
22	"	"	25	Explosion.	—	—	—	Uncertain.	+ 0 "	80 "	27 d. v.	+ 15 "	2.9	Deaf.	C ₁	+ 23 "	7.4
23	"	Female.	78	—	—	—	—	In better.	+ 8 "	1 m	F ₁	+ 15 "	1.1	7 m <	A ₁	+ 25 "	1.2
24	"	"	18	—	—	—	—	In poorer.	+ 20 "	90 cm	D ₁	+ 19 "	2.9	1 m	19 d. v.	+ 29 "	1.1
25	Traumatic rupture.	Male.	34	Hit.	—	—	—	" " "	+ 8 "	—	—	+ 19 "	2.9	—	—	—	2.7
26	Nerve deafness with	"	27	—	—	—	—	" " "	+ 8 "	—	—	+ 19 "	2.9	—	—	—	2.7
27	O. M. P. Res.	"	31	—	—	—	—	" " "	+ 8 "	—	—	+ 19 "	2.9	—	—	—	2.7

¹ In the cases of sclerosis, traumatic perforation, and Case 27, the duration of perception is here indicated only for the testing with the A tuning-fork, in the cases of nerve deafness the same only with the a¹ tuning-fork

REMARKS ON THE ABOVE CLINICAL HISTORIES.

As is manifest from the clinical histories presented above, those cases of hardness of hearing were considered, according to Bezold's proposition, as sclerosis of the sound-conducting apparatus, which, with nearly completely normal *Mt*, absence of gurgling sound on auscultation during catheterization, presented the following *triad* of functional symptoms: (1) a lesser or greater contraction of the tone scale in its lower limit per A. C.; (2) a prolongation of B. C. above the normal, at least for tones in the lower compass of this scale (Schwabach); and (3) either a marked contraction or a negative result of the Rin   test.

Circumscribed and diffused thickenings of the *Mt* were not considered, as Bezold has shown in "Schuluntersuchungen" that these changes have an imperceptible effect on the hearing.

The range of hearing for speech goes, as a rule, hand in hand with the lowering of the lower-tone limit, although exceptions also are noticed.

Rin  's test generally gave negative results in the cases of sclerosis and in only two ears (Case 2 right and Case 10 left) with relatively almost normal hearing distance for speech a more or less contracted positive result in the tested ear.

(In Case 1 right, Case 2 left, and Case 7 right, the nearly or quite normal result of Rin  's test, as also the hearing distance for the whisper, was not impaired.)

The "A" fork upon the vertex was always heard longer than in the normal. The results with other tuning-forks are reported below.

The age of the patients varied between twenty-one and fifty-four years (thirty-five years on the average). Five were men, six were women. Heredity was noticed in two cases only. Subjective sounds were observed in ten cases, vertiginous symptoms in three. All those cases of hardness of hearing were accounted as of nerve origin, which showed normal *Mt* and tubes, and the following functional conditions: (1) a contraction of the B. C.; (2) a sure perception of the deeper tones, entirely or almost, up to the normal lower-tone limit

for A. C. ; and (3) an uncontracted or slightly positive result of the Rinné test.

In only two cases (19 and 21) was the Rinné test (always with the a^1 fork) in one ear found to be ± 0 ; in both of these ears the hearing distance for the whisper was so disproportionately worse than on the other side that this behavior of the Rinné test was to be expected, as evidently the B. C. of the better ear here manifested itself. In one case (Case 24) the Rinné test could not be utilized, as the patient neither heard the tone of the " a^1 " fork by A. C. nor by B. C. In the remaining cases the Rinné test was indicated as $+t$, *i. e.*, the tuning-fork " a^1 " was generally no longer heard by bone, but only by A. C.

The age of the patients with nervous deafness vary between ten and seventy-eight years (average forty-one years). Eleven were men, four were women. Heredity was noted with certainty in two cases (22 and 24). Subjective noises existed in twelve cases, and vertigo in seven cases.

Though the number of cases examined is small, it shows the same contrast between sclerosis and nerve deafness, which Bezold had found in his statistics.

Passing now on to the consideration of the results obtained by my examinations according to the method of Bezold-Hartmann, I will, for the sake of clearness, divide my description into two parts, and at first speak of the A. C.

Even a passing glance at my diagrams (see Plates I.-III.) suffices to notice a sharp difference between a case of sclerosis and a case of nerve deafness. In the first the acuteness of hearing of the patient increases within the generally accessible tone scale rather regularly with the mounting of the tone heights; in the second case the reverse is the case, at least in the majority of instances.

This result, which corroborated the experience of Hartmann and Gradenigo, could by no means be unexpected.

Even the regular absence of a portion of the lower end of the scale in sclerosis and the generally more or less complete preservation of this portion in diseases of the internal ear, while in the latter the upper end of the scale

by the Galton whistle, etc., more frequently shows defects, pointed to the possibility of such a contradictory condition in the course of the scale.

In whatever way we may undertake the investigation of the duration of perception of the different tones in the diseased ear, whether according to Hartmann's method, or in the way I undertook, according to the suggestion of Bezold, we always have to determine the threshold value for each patient.

"Just as the threshold excitation constitutes a convenient and relatively certain help in many psycho-physical and physiological investigations, in particular also for the hearing organ, we are entitled," says Bezold, "to employ it in our diagnostic tests of the diseased ear."

When we ascertain the threshold value of a tone, we determine at the same time its sharpness of perception (its audibility). That the individual portions of the scale behave very differently in the different localizations of diseases in the ear, according as they depend upon disease of the conducting or of the perceiving apparatus, has long been shown by numerous publications.

WOLLASTON¹⁸ declared in the beginning of the nineteenth century that the hardness of hearing, which originated through increased tension of the *Mt*, manifests no uniformity for high and low tones, but only deafness for low tones.

Furthermore POLITZER¹⁹ says in his text-book, that he has shown upon the basis of his experimental investigations on the cadaver, that in impediments in the sound-conducting apparatus of the middle ear in general high tones are better heard than deep.

MACH and KESSEL²⁰ found, that already with an increase of the air pressure by 14 *cm* of water, the deeper tones disappear. Experimenting with deep organ pipes; the latter author found an extinction of the fundamental tone and an accentuation of the over-tones.

LUCAE²¹ and others noticed the same in persons that could contract their tensor tympani at will.

BEZOLD²² observed further that by artificial retraction of

the *Mt*, which a person can bring about by a deep inspiration during firm closure of the nose and mouth, the lowest portion of the tone scale is extinguished, the duration of perception for the middle tones is shortened, and the acuteness of hearing remains unchanged only for the higher tones (c^4 and fs^4). The same results are observed with Valsalva's experiment.

Already JOHANNES MÜLLER¹¹ has attempted to give an explanation of these phenomena. According to his opinion these phenomena are explained by the elevation of the fundamental tone to which the *Mt* is tuned.

In all these cases it is evident that the normal functional conditions of the sound-conducting apparatus are artificially changed, and it is therefore very natural to believe that analogous functional disturbances exist, also in pathological changes of the sound-conducting apparatus.

In fact the investigations of Bezold have completely confirmed the above. "The A.C. is the more impaired in disease of the sound-conducting apparatus the lower we go in scale, and if we only possess continuous sources of tone, reaching far enough down, we can ascertain the tone limit in every case, be it great or slight disturbance of this apparatus. From this limit downwards the remaining portion of the tone scale is no longer heard per A.C." Concerning sclerosis in particular, in fifty-eight cases investigated by BEZOLD¹² the whole lower scale from A down remained unperceived in thirty-two cases and even in one case from A' down.

The same was found by Alderton, who says "that in cases of otitic media catarrhalis the duration by A.C. is impaired principally for the deeper forks."

Concerning diseases of the perceiving apparatus, BONNAFONT¹³ has already shown, that in nerve deafness the ability of perception for high tones decreases, while deep tones are still well perceived.

LUCAE¹⁴ says, that "complete loss of the higher musical tone, to which the normal acoustic re-acts most sensitively, indicates with certainty an affection of the internal ear."

OSCAR WOLF,¹⁵ by means of his qualitative testing of the

hearing by speech, noticed that in labyrinth diseases the patients hear the deeper tones very well, while the Sch tones, whose height of tone varies according to his investigation between a^3 and fi^4 , were no longer perceived.

SCHWARTZE²² has described a permanent loss of perception for high tones and later total deafness in a musician, produced by a locomotive whistle.

Finally, I have already shown that Bezold considers "an unmistakable perception for the deeper tones nearly or completely up to the lower-tone limit for A. C." as the most certain symptom to exclude a chronic middle-ear affection.

It might be expected after all the above, that as by each of the two known forms of disease of the hearing apparatus a greater or lesser portion of the tone scale disappears, in one the deeper, in the other the higher tones, in the remaining portions of the tone scale a certain corresponding relation between the tones will exist.

In this connection it should be pointed out, the results obtained by Gradenigo, Hartmann, and myself, according to the method of Hartmann, are very instructive.

When we compare the cases of sclerosis with each other, the retention of that portion of the tone series for which hearing still exists corresponds as uniformly to our suppositions as one can wish. In only two cases (9, 10) have I been able to observe that the tones of the tuning fork a^3 were perceived somewhat less than the tuning-fork a^1 . This can therefore easily be an error of observation. *In all other cases every higher tone was heard better than all the remaining deeper tones.* The differences which my diagrams offer between one another are exclusively quantitative and not qualitative; these differences appear in the impairment of a greater or lesser number of the deeper tones and in a correspondingly increasing lowering of the acuteness of hearing for the remaining portions of the tone scale.

Much more varied in their form are the diagrams of **nervous hardness** of hearing. In the majority the resulting curves have an irregularly undulatory appearance. They show, as a rule, conformably to the prevailing theory, in-

creasingly worse hearing for the higher tones, but show at the same time in unmistakable fashion that it is not at all rarely the case that in the portions of the remaining tone scale one or more higher tones were heard better than the deeper. Even so in disease of the nerve apparatus can one or another tone tract in some one portion of the scale, as also in its lower end, be quite extinguished.

These facts permit of a very simple explanation. In sclerosis we have to do with the disease of an apparatus, whose individual parts stand in quite a fixed functional connection in each given case. In other words, *we have always to do with the apparatus as a whole*. The apparatus is then also as a whole, *i. e.*, in its co-ordination, altered, when in any way only one of its parts is affected, hence evidently in one case the alterations can be greater, in another slighter.

As an especially instructive example might still be added the case of traumatic rupture of the *Mt* (Case 26) in the above clinical histories. The injury happened to a previously normal ear, as we might conclude from the statement of the patient and the condition of the other ear. The trauma had limited itself to the rupture of some fibres of the *Mt* and left the nerve apparatus intact, as we can conclude by the entirely similar height of the upper-tone limit with the E. G. whistle on both sides. The obtained diagram and the other behavior correspond entirely with the functional picture obtained in sclerosis; only all alterations are less pronounced, corresponding to the slight anatomical lesion of the sound-conducting apparatus and the slight lowering of the hearing distance for speech.

Quite otherwise is the behavior of diseases of the perceiving apparatus. Each one of its parts has its specific design, and the alteration of a part does not necessarily influence the function of the remaining parts. When we consider the dissimilar causes generally leading to the development of labyrinthine affections, we must expect only exceptionally to see a disease of the entire labyrinth as a whole, and still more rarely a similar disease of all its individual parts, although this may occur. Even so is conceivable.

ble a successively uniform increasing diminution in the scale upwards or downwards; in the latter case the corresponding diagram may appear just as regular as in sclerosis, and may come to resemble it entirely, to which Hartmann's third type of hardness of hearing corresponds. As such are evidently to be understood the two observations, 20 and 22. In both cases the beginning of the development of the hardness of hearing was caused by a single strong and unexpected concussion (gun explosion). Moreover, in both cases a permanently injurious action was brought about through their profession, both were millers; in one also existed the heredity disposition. In these cases we must believe that the disease affected all parts of the labyrinth rather uniformly, only that the upper was affected successively more markedly than the lower, and hence the corresponding diagram represents such regularity. In the remaining cases the diagrams corresponded to Hartmann's 4th type of hardness of hearing, which, as said before, might well be expected *a priori* as the more frequent. In two cases the cause was an undoubted inflammation—*i. e.*, a process, in which one must assume that the individual parts were attacked in unequal degrees, as in atrophic processes, the existence of which could reasonably be admitted in the above two cases. One of these cases (18) was examined in the acme of cerebral syphilis, in the second (15) the disease originated as a sequel to measles. To these cases may apparently be added a third, in which the patient declared the affection originated through the use of large doses of salicylates. In all the remaining cases, the etiology is either unknown or at least not determinable with such certainty as in the first two cases.

Case 25 stands quite isolated, and undoubtedly is to be considered as a disease of the internal ear. Judging from its diagram, it corresponds, at least so far as concerns the A. C., with none of the types described by Hartmann as belonging to nervous deafness, but corresponds much more, at least for the A. C., entirely to the form which Hartmann and we have found in sclerosis. Nevertheless we cannot doubt that exceptionally disease of the nerve apparatus

may also produce the form which regularly exists in sclerosis. The diagnosis of a hardness of hearing in such a case is sufficiently assured through the characteristic opposite condition of the B. C. and the results of the Rinné test.

As above stated, my design was to investigate exclusively such cases as showed only one form of disease, and not a combination of diseases of the sound-conducting and perceiving apparatus. An exception was made in one case in which the clinical condition was especially clear. In this diagnostically undoubted case (27) of residues of a former affection of the conducting apparatus, as is plain from the statements of the intelligent patient (physician) and the examination of the ear, the functional examination, according to Bezold's method, showed, moreover, an unequivocal affection of the perceiving apparatus. The latter diagnosis is sufficiently proven by the contraction of the B. C., even for the tones A and a, the considerable lowering of the upper-tone limit by the E. G. whistle, and the nearly normal positive result of the Rinné test on both sides. The diagram of this case, obtained in the usual way upon the basis of the testing of the duration of A. C. of different tones, is very interesting; it shows us, namely, in the lower half of the scale the usual picture of disease of the sound-conducting apparatus, and in the upper half that of nervous deafness. We obtain here in one part the picture of the latter, just as in Cases 20 and 22 (compare diagrams), but on the other side, in the lower part of the scale, the increasing contraction of the tones up to the disappearance of the lowest portion, as it occurs in the results of middle-ear suppuration and other affections of the sound-conducting apparatus, so that in this case the culminating point of the best hearing falls in the middle of the scale.

There still remains one word to say upon the investigation of B. C. for tones of different heights, according to Hartmann's method. As already intimated above, these investigations were limited to three tuning-forks. Concerning this, I may limit my remarks to a few words, as all my results completely confirm the generally known investigations of Schwabach, Hartmann, Bezold, and others.

As is known SCHWABACH " was the first to find, that in impediments to sound-conduction in consequence of diseases of the middle ear, the vibrations of a tuning-fork brought in contact with the bones of the head were perceived longer than in the normal condition, whereas in diseases of the acoustic nerve the perception was shorter than normal.

The fact that in diseases of the sound-perceiving apparatus a diminution of the B. C. also for high tones takes place, has long been known.

In our above collected cases of sclerosis there was observed without exception a lengthening of the B. C., which appeared especially marked in examinations with the deeper tuning-fork A. In nearly half of the cases (five) there was observed a considerable lengthening by B. C. for all of the three forks tested. In the cases of sclerosis with considerable impairment of hearing there was a more or less marked diminution of the duration of perception also for B. C., which concerns, however, only the higher tones and increases successively according to the elevation. The fork A was always heard still longer than normal. The duration of B. C. tested with the remaining two forks was either equal to or shorter than the normal; indeed it can even entirely disappear for the a¹ fork (Case 2).

Quite the contrary was observed in the *diseases of the perceiving apparatus*. In all of the above cases of disease of the internal ear there existed a contraction of B. C., increasing with the pitch of the tone.

Alderton also arrived at the same result through his investigation.

The quantitative measurements given here of the duration of perception for a long series of tones in the whole course of the scale have yielded results which agree with the results of the functional examination of the ear up to the present. Moreover, the above investigations show that this method frequently possesses a considerable diagnostic value. Attention, in this connection, is called to the four cases of sclerosis, in which we found a distinct reduction of the lower-tone limit for one ear, while in the other ear, with apparently

little or no hardness of hearing for speech, the lower-tone limit was nearly normal. One case here must unfortunately be put aside, because the better ear was not examined according to the quantitative method (Case 7). The more important are the remaining three cases (1, 2, and 10), which show of what diagnostic significance this quantitative examination method sometimes can be. In two of these cases (1 and 2), according to the testing with speech, the sclerosis of the sound-conducting apparatus appears to be limited exclusively to one ear, while sclerosis, as is known, generally appears bilaterally (according to Bezold in 88.8 per cent. bilateral and only in 11.2 per cent. of the cases unilateral). In these two cases a completely normal state is shown for the other ear by the testing with speech. The hearing distance for speech in the third case (10) was reduced to 4 *m*. Only the quite inconsiderable shortening of the normal lower-tone limit (Cases 2 and 10), and the shortening of the Rin   experiment, as found in these cases, could justify us in assuming, also in the second seemingly normal ear, the inception of the same severe disease. This assumption could be confirmed by the quantitative examination extending over the whole scale. In these cases, namely, was the normal duration of perception for high tones found successively more and more contracted downwards for the deeper tones, in one case (1) only in a slight degree, relatively marked in both the others.

The only unfavorable side to the extended quantitative measurement in practice is the disproportionately long time which they require.

Alderton's remark, that in judging of the relative advantages of different methods we should, least of all, consider the time consumed, is certainly for physiological and clinical investigations completely justified, but where further methods exist, which furnish nearly equally accurate results, the question of time is, at least for the practitioner, not unjustifiable.

Such a shorter method is the one which Bezold recommends for the examination of ear patients. The testing of the lower and upper-tone limits, the duration of B. C., and

the Rinné experiment are indispensable in each case of doubtful diagnosis; the quantitative examination which extends over the whole scale, is certainly not absolutely necessary for the diagnosis, but well might be pointed out as a substantial and instructive supplement to our nosological knowledge of the picture of the disease.

Concerning diseases of the internal ear, the above described examination, extending over the whole scale, enables us not only to determine the diagnosis of disease of the cochlea in general, for which the hitherto used methods are sufficient, but also to localize upon the basis of Helmholtz's theory the disease of certain circumscribed places of the scala cochleæ.

In conclusion I wish to express my heartfelt thanks to my honored teacher, Prof. Dr. Bezold, as well for suggesting the foregoing investigations as for his friendly assistance in their execution.

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REPORT OF MEETINGS OF THE HUNGARIAN OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.¹

By L. POLYÁK
(Secretary of the Society).

Translated by Dr. A. DUANE, New York.

NOVEMBER 15, 1894—JANUARY 25, 1895.

BÖKE : A Case of Sinus-Phlebitis.—Patient, male, gave a history of otorrhœa with repeated attacks of earache since his childhood. For fourteen days continuous violent headache, and for eight days vertigo so intense that he could scarcely walk.

When received into hospital, patient much prostrated, answers questions slowly, complains constantly of pain. Mastoid intact and not sensitive to pressure. Great tenderness behind the mastoid and all along the sterno-cleido-mastoid down to the clavicle; the jugular plainly felt by palpation, appearing as thick as the little finger. Walls of external meatus normal; latter contains foetid pus mixed with epithelial shreds; membrana tympani replaced by fleshy granulations. Hearing for watch and voice, o. With Weber's test, patient's answers unintelligible. In the evening patient had a chill; temperature, 38° C. Iced applications gave no relief.

No operation was performed, the patient's condition being regarded as hopeless on account of the continuous fever (amounting to 40° C.), repeated chills, and the stupor. Jaundice set in on the fourth day, followed by diarrhœa with yellowish and sometimes bloody stools. Seventeen days after admission the patient died, after repeated attacks of convulsions.

¹ Report abridged, and laryngological part omitted.

Autopsy showed an abscess as large as a walnut on the under surface of the cerebellum. In its vicinity, the white substance was softened and broken down, and the pia was covered with a fibrinous exudate. Tegmen tympani intact. The inner wall of the sigmoid fossa was porous and showed a perforation 2 cm in diameter close to the jugular foramen, and the sigmoid sinus was blocked up partly with an organized thrombus, partly with broken down, brownish debris adherent to the sinus-wall. The same changes visible in the internal jugular vein. Metastatic abscesses in the peripheral parts of the lungs, necrosis of the pleura, fibrinous and purulent exudation in both pleural cavities, parenchymatous degeneration of the liver and kidneys.

BÖKE: Removal of a Foreign Body in the Tympanic Cavity by Operation.—A girl, three and a half years old, had put a grain of maize in her right ear; fourteen days before she was seen, unsuccessful attempts at removal; since then pain and discharge. On examination, there were found excoriations of the auricle and canal. The foreign body was seen imbedded in a perforation in the posterior-inferior quadrant of the drum-membrane; the latter elsewhere was red and swollen. Ear ordered to be syringed out every two days.

Thirteen days after she was first seen she was put in the hospital, and another unsuccessful attempt was made to remove the foreign body. The temperature then rose slightly (38.8° C.). Syringing with boric acid ordered three days later, anæsthetic given, auricle dissected up, and posterior cartilaginous wall of the meatus divided. Foreign body, which was found to lie wholly in the drum cavity, was here readily removed, and the wound was sewed up and dressed. For two days no serious reaction. On the third day beginning pain in the neck, and twelve days after operation evident signs of meningitis, which, in three days later, ended fatally with coma and convulsions.

Autopsy showed fibrino-purulent leptomeningitis of base of brain and of the cord, with consecutive acute internal hydrocephalus. Acute catarrh of the middle ear. Purulent otitis externa with consecutive hyperæmia and œdema of the interior of the mastoid. Operation wound partially healed. Catarrhal bronchitis of the lower lobe of both lungs.

BÖKE: Facial Paralysis in the Course of an Acute Middle-Ear Catarrh.—The patient, aged twenty-five, had, immediately after exposure to the weather, developed earache and

deafness, and on the following day facial paralysis of the same side developed (affecting the tongue, but leaving the uvula exempt). Seen on the following day, when he showed injection of the drum-membrane, particularly along the handle of the malleus, with sunken drumhead and absence of the cone of light. Air introduced into the tympanum by catheterization produced a crackling sound, but no essential elevation of the depressed membrane. Watch heard only on contact; on Weber's test, fork lateralized in affected ear. By the use of cold applications and politzerization, both the catarrh of the tympanum and the facial paralysis disappeared.

This sort of facial paralysis is usually called "rheumatic," the deafness being overlooked on account of the good hearing in the unaffected ear. It may originate either from a dehiscence of the bony wall of the Fallopian canal, allowing the swollen mucous membrane of the middle ear to press directly upon the nerve; or from pressure upon the latter by the stylo-mastoid artery which runs in the Fallopian canal and which shares in the general distention of the tympanic vessels. The spot where the nerve was compressed, in the present case, must, since the uvula was intact, have been beneath the genu facialis, for the fibres running to the uvula arise from the geniculate ganglion.

FEBRUARY 29, 1895.

POLYAK : Tuberculoma of the Nose (Demonstration).—The patient, a woman, forty-nine years of age, had for six months had epistaxis from right naris and gradual occlusion of latter; for six weeks formation of crusts in left naris, and epistaxis from latter also. A flat, slightly elevated whitish mass, bleeding readily, and covered with crusts and here and there with granulations, was found on the septum in each naris. From the mass in the right naris projected an irregular nodular tumor, looking like granulation tissue, and entirely filling the cavity of the nose on that side. This tumor was removed with the galvano-cautery snare. It was 30 *mm* long and 14 *mm* broad; was red externally, grayish on section. The mucous membrane covering it was partially deficient; where present it was thickened, indeed almost like cuticle. The tumor consisted of a network of connective tissue, poorly supplied with vessels, and containing in its meshes numerous tubercles containing a few characteristic giant-cells and surrounded by infiltrates of round cells. Bacilli very few; mostly in the giant-cells.

The cartilage at the portion of septum affected had disappeared. No tuberculosis of the lungs or other organs, and no signs of cachexia.

Tuberculosis of the nose occurs usually under the form of granulating ulcers, which show a great tendency to break down. Its occurrence under the form of a tumor, as in the present instance, is very rare. It shows a great tendency to recur, but only rarely leads to general tuberculosis.

KREPUSKA : Primary Carcinoma of the External Auditory Meatus (Demonstration).—The patient, a woman, sixty-two years of age, had suffered for years from eczema of both external auditory canals. Treatment caused complete cure in the right and considerable improvement in the left. Four months later granulations discharging pus and blood formed on the cartilaginous portion of the left canal. This turned out to be an epithelial cancer, which spread to the membranous portion of the canal and, after perforating the bony canal, to the retro-maxillary region. Later also œdema of the auricle and mastoid developed. The operation, although regarded as entirely hopeless, was undertaken at the urgent instance of the patient herself. The tumor was then found to fill the whole tympanum and to extend into the sphenomaxillary fossa and the back of the throat. Death eight months after the operation.

From the histological examination it was apparent that the starting-point of the tumor was the excretory ducts and the acini of the ceruminous glands. The malleus, while retaining its original form, was converted into a peculiar non-osseous mass of connective tissue, filled with cancer-pearls. The incus, on the other hand, was only partly cancerous.

The author regards the eczema as being at least an accessory cause of the development of the carcinoma.

MAY 24, 1895.

LICHTENBERGER : Case of Neuralgia of the Mastoid Cured by Operation.—A girl, sixteen years old, was said to have suffered from childhood from a variety of aural affections. For three months constant excruciating pain over entire left mastoid region. Marked bilateral deafness. Except for evidences of an otitis media catarrhalis sicca, no lesion objectively perceptible in either ear or mastoid.

The mastoid was opened, and, except for the pallor of the mucous membrane lining the cells, was found to be perfectly

normal. Cells numerous and extending through the whole bone. Complete extirpation of the mastoid performed. No reaction ; complete disappearance of pain ; marked improvement of hearing. The latter may be regarded either as the direct result of the operation or as due to the fact that the sensitiveness of the auditory nerve, which had been depressed by the constant pain, had been restored upon the cessation of the latter. Three months later the patient developed similar severe pain on the right side, for which also an operation had to be performed. Left side up to time of last note remained entirely free from pain.

In the discussion, KREPUSKA reported the case of a woman, sixty-three years of age, upon whom he had performed paracentesis for an exudative catarrh of the middle ear consecutive to influenza. The otitis was cured in ten days and the fever disappeared, but violent pain radiating over the whole side of the head set in, and persisted, in spite of treatment, until a week after, when the mastoid was opened. The latter was found to be totally sclerosed and eburnated. No pus or other morbid material found. The pain ceased at once, and the hearing improved. Primary union.

NÉMAI : Empyema of the Sphenoidal Sinus and Ethmoid Cells.—History of occlusion of nares of ten years' duration, with purulent discharge and hemicrania. Polypi in right middle meatus. Creamy pus between middle turbinate and septum. Necrosed bone could be felt when a sound was introduced into the sphenoidal sinus, and small quantities of pus could be evacuated from the latter by syringing.

JUNE 11, 1895.

TOMKA : Objectively Perceptible Noises in the Ear.—A boy, six years of age, was under treatment for deafness, resulting from a chronic otorrhœa which had run its course. Hearing for whisper improved by repeated politzerization in from three-fourth metre at the beginning of the treatment to five metres at the time of last record.

In postero-inferior part of right drum-membrane a dry perforation, through which can be seen the promontory, covered with normal mucous membrane, and the fenestra rotunda. Eustachian tubes freely pervious. Left, hearing normal. In Weber's test, sound of fork lateralized in the poorer (right) ear. Rinné, right negative ; left uncertain. Throat swollen and granular.

For two weeks noises emanating from ear and audible at a

distance of one metre. Occur at irregular intervals ; produced involuntarily and increased by movement of the patient and by talking ; unaffected by swallowing, chewing, and pressure on the carotid or soft palate. Patient has the bad habit of drawing the nasal mucus back into his throat and spitting it out ; and when this habit was corrected the noises diminished.

Noises probably due to contraction of the tensor palati.

TOMKA : An Instrument for Operating upon Cases of Chronic Suppuration of Shrapnell's Membrane.—This is a trephine for removing a portion of the margo tympanicus in order to make the attic more accessible to treatment in cases of foetid suppuration from this locality. The pin of the trephine is entered and carried in until the teeth of the trephine are engaged, then the pin is removed and the trephine cautiously advanced by rotation. If more room is required, the trephine may be introduced twice, so as to make two openings side by side. Care must be used in applying the instrument, as otherwise the malleus and incus may be luxated.

LICHTENBERG : Contribution to the Question of the Operative Treatment of Chronic Tympanic Suppuration. Successful Radical Operation.—The patient, a man of forty, had seven years before an otorrhœa with mastoid swelling. After incision of the latter the symptoms had almost completely subsided. Eighteen months before Lichtenberg saw the patient, the otorrhœa recurred, the discharge showing periodical fluctuations, its decrease being associated with vertigo, headache, and sense of pressure.

Examination showed a perforation in the postero-superior quadrant of the membrane, extending backwards ; a fluctuating swelling extending down the posterior wall of the canal, and a pin-hole fistula in the mastoid. Both swelling and fistula were caused by pus from the antrum burrowing between the mastoid and the posterior wall of the canal. The latter, which was carious, and the exterior wall of the attic were removed, and the tympanum, external canal, and mastoid were thrown into one cavity. Everything carious was removed. The operation was done in the clinic, and the patient allowed to go home in four hours. Iodoform gauze was used for the first, and plain sterile gauze for the subsequent dressings. A cure was effected in six weeks. Disappearance of headache, and considerable improvement in the hearing.

OCTOBER 17, 1895.

ZWILLINGER : A Foreign Body Remaining in Nose for Eight Months. Fœtid Discharge. Asthma.—The foreign body was a tampon introduced with a Bellocq's canula. It was removed by catching up with a snare the threads attached to the tampon.

LICHTENBERG : Acute Otitis Media. Subdural Abscess. Cure.—Two cases of mastoid empyema occurring in acute otitis. In one there was a collection of pus between the dura and bone. Both were cured by operation.

STIPANITZ : Removal of the Inferior Turbinal.—Stipanitz recommends removal of the inferior turbinal either with the chisel or sometimes with the bone-forceps and scissors. A weak sublimate solution is sprayed through the nose before the operation, and a 10 per-cent. solution of cocaine is used as an anæsthetic. Hemorrhage, which is seldom great, is controlled by the application of alum. After the operation the nose is plugged with iodoform gauze, and the tampon is changed two or three times a day. A cure results in eight or ten days.

POLYÁK in discussing the paper thought that the operation could seldom be required, a cold snare being usually sufficient when it was simply a question of removing a portion of the turbinal which was in the way of parts to which access was desired, and the galvano-cautery being more efficient when the object of the operation is to reduce an hypertrophy.

SZENES : Caries of the Mastoid Due to Influenza. Cure by Operation.

REPORT OF THE TRANSACTIONS OF THE SECTION OF OTOTOLOGY OF THE 66TH CONGRESS OF THE GERMAN NATURALISTS AND PHYSICIANS, VIENNA, SEPTEMBER 24-30, 1894.

REPORTED BY DR. ALBERT BING,¹ VIENNA.

Translated and abridged by AD. O. PFINGST, M.D., New York.

In opening the congress Professor Politzer made a short address of welcome in which he referred to the progress made by the Society since its organization in Vienna thirty-eight years ago. He spoke of the organization of the section of Otology in 1868, and of the high standing of Otology among the leading specialties of to-day.

Among the papers read the following were of particular interest :

Dr. ROHRER: On Hysterical Deafness and Torpor of the Auditory Nerve.—Paralysis of the auditory nerve of hysterical origin is relatively infrequent. It is characterized by marked fluctuation in the function of the ear and rapid changes of the accompanying symptoms.

The symptoms may be part of a general hemianæsthesia or may appear independently. They may be unilateral or bilateral, with a variation of the hearing from very slight to profound deafness.

Dizziness is never present. Tinnitus aurium may occur. The middle ear usually remains unchanged.

In another class of cases, while there is no general hemianæsthesia there is always a concomitant lesion of the middle and sometimes the internal ear. This form, which shows a great vari-

¹ Regular society reports now being a part of the program of these ARCHIVES we supply an abstract of the above very successful meeting.

ation in its symptoms, has a transitory character. It also may occur on one or both sides.

SZENES, Budapest : **On the Therapeutic Value of Carbolic Acid and Glycerine and of Menthol in Diseases of the Ear.**

Professor GRADENIGO, Turin : **Sclerosis of the Middle Ear Occurring in Latent Inherited Syphilis.**—This affection of the ear may be looked upon as a variety of those diseases of the ear typical of hereditary syphilis in its latent stage, as described by Hutchinson and Hinton. It has the same clinical feature as chronic middle-ear catarrh with involvement of the labyrinth. Good results may be expected from constitutional treatment if it is begun early.

Dr. SCHUBERT, Nuremberg : **Brain Abscess.**—Dr. Schubert reported a case of brain abscess occurring after acute otitis media which had terminated in resolution. The symptoms began with a paresis of the 6th nerve, followed by crossed monoplegia and hyperæsthesia and later by sopor, with slowing of the pulse and Cheyne-Stokes respiration.

The operation performed at the seat of election for these cases disclosed a small abscess of the temporal lobe. A slight abatement of the symptoms followed the operation, but the case took a fatal issue five weeks later.

The autopsy revealed the presence of another abscess, of larger dimensions than the first, in the temporal lobe.

Dr. GOMPERZ, Vienna, presented a boy whose drum-membrane typified the conditions produced by the encroachment of the bulb of the jugular vein on the tympanic cavity. Gomperz stated that of the five reported cases, in which the vein had been punctured during paracentesis of the drum, one had terminated fatally, and suggests that the paracentesis be made in the antero-inferior segment of the drum in these cases.

Professor GRUBER spoke of a case occurring in his clinic. The drum-membrane had not appeared blue in that case, an explanation for which might be found by a deeper situation of the vein.

Dr. BRIEGER had observed a case in which the bulb of the vein did not extend as far forward at the anterior segment of the drum as in the demonstrated case.

Professor ZAUFAL suggested that in cases where the vein is wounded small tampons should be passed through the wound in the drum membrane into the drum cavity.

Professor POLITZER had seen hemorrhage result from wounding of the vein which accompanies Jacobson's nerve.

Professor HABERMAN had observed a case where the jugular vein projected through a spontaneous opening in the floor of the tympanic cavity as high as the horizontal semicircular canal. The latter also presented a small aperture.

Dr. BRIEGER, Breslau : **On Otitic Brain Abscesses.**—Brieger spoke of the symptoms peculiar to abscesses emanating from a diseased ear. He laid special stress upon the importance of the ophthalmoscopic changes.

Brieger also advocated the examination of the urine for peptone, as an aid to the diagnosis of intra-cranial suppuration. He recommended puncture of the sub-arachnoid space to differentiate between abscess and meningitis. He also briefly reported a case where an abscess of the brain had opened spontaneously through a fistulous passage in the upper wall of the ear canal. The patient died later from sinus-thrombosis.

Professor URBANTSCHITSCH cited a case of caries of the temporal bone in which the notable symptoms were agraphia and the inability of the patient to make himself understood. His speech was entirely unintelligible. Later there were spastic contractions of the extremities of the right side. His symptoms, which were all of a transitory nature, appeared alternately. At the autopsy it was seen that meningitis had existed, there being no sign of a cerebral abscess. The symptoms had no doubt been caused by a transitory oedema.

Urbantschitsch once saw a case which the subsequent autopsy showed to be oedema, in which deafness and blindness were the alternating symptoms.

Professor GRUBER related a case of brain abscess seen in his practice in which blindness and deafness were present, which opened spontaneously into the external auditory canal. The pus had the peculiar foul odor characteristic of brain abscess.

Dr. REINHARD, Duisburg, demonstrated upon the head of a cadaver the mode of entering the mastoid cells, of removing the posterior and part of the upper wall of the ear canal, and showed how, by making two horizontal sections through the membranous ear-canal, the placing of flaps over the cavity could be facilitated.

Professor KIRCHNER, Würzburg : **On the Occurrence of a Thrombus of the Cavernous Sinus in Acute Suppuration of the Middle Ear.**—Kirchner calls attention to the suddenness with which thrombosis of the cavernous sinus may appear, in

acute suppuration of the middle ear, without any preliminary symptoms to indicate retained pus. These cases, which usually occur as a sequel to influenza, call for an early paracentesis in order to avoid the entrance of retained pus into the lymph or blood.

Dr. BING, Vienna : **Experiments on Irrigation of the Tympanic Cavity.**—Perforations of different sizes having been made in the drum membrane of a number of cadavers, a colored solution was injected into the Eustachian tubes through a catheter. By the immediate removal of the tegmen tympani and the roof of the mastoid cells, it was observed that the solution had, in those cases with a small perforation in the drum, penetrated mastoid cells and antrum, where the drum had a large opening, the fluid flowed off freely without entering the attic or the antrum.

It follows from this that, while a large opening is necessary to allow free flow of the solution, the desired effect of thorough irrigation is not attained under such conditions.

Dr. GOMPERZ, who formerly irrigated the middle ear, does no longer approve of it. He observed a case in which the irrigation was followed by unconsciousness, collapse, and, a few hours later, by death.

Professor POLITZER, who has sometimes found a cessation of pain following the irrigation, would not like to part with it as a therapeutic measure.

Dr. GOMPERZ, Vienna : **(a) On the Results of Conservative Treatment of Chronic Suppuration in the Attic.**—Out of twenty cases, nineteen were cured, with an average duration of twenty days. The reaction stopped, granulations ceased to form, the mucous membrane became pale, and the hearing improved.

Gomperz resorted to the removal of the ossicles only after the conservative treatment had failed. This consisted in applying a 15–20 solution of nitrate of silver or a solution of perchloride of iron to the granulations, irrigation of the parts through a canula, and dusting with boric acid.

(b) On the Efficacy of Artificial Drums.—Dr Gomperz has made the observation that in those cases of perforation of the drum where there was considerable space between the perforation and the foramen ovale, where, in other words, a niche behind the handle of the malleus exposed a deep cavity, the artificial drum

did not always improve the hearing. Cotton discs were more effective, while the membrane formed by boric acid, recommended by Kosengarten, acted best.

Professor POLITZER closed the successful congress with a few appropriate remarks, in which he thanked the members present for the interest displayed during the meetings.

REPORT ON THE PROGRESS OF OTOTOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1895.

By Dr. A. HARTMANN, BERLIN.

Translated by Dr. A. DUANE, New York.

A.—ANATOMY.

a.—EAR.

272. ZUCKERKANDL. A point bearing upon the anatomy of the temporal bone. *Monatsschr. f. Ohrenh.*, No. 9, 1895.

273. GRUBER, J. Upon an abnormal cavity in the petrous portion of the temporal bone. *Ib.*, No. 12, 1895.

274. STEINBRÜGGE, H., and NIESER, O. Drawings of the vestibule in man. An atlas containing 25 photographs made from serial microscopic sections. Vienna, 1895.

275. POPOFF, N. M. Upon the course of the bundle of nerve-fibres known as the conductor sonorus. *Deutsche Zeitschr. f. Nervenh.*, vii., 1895.

272. ZUCKERKANDL describes the temporal bone of a boy of fourteen, in which various peculiar conditions had been produced by abnormal ossification. A. DUPUIS.

273. GRUBER found in the petrous portion of the temporal bone a pneumatic cavity separated by thin bony walls from the tympanic cavity, the sulcus jugularis, and the internal auditory meatus, and communicating with the mastoid cells by several small apertures. In size it was $2 \times 1.5 \times 1.5$ cm. The dangers to which suppuration developing in such a cavity might give rise are obvious. KILLIAN.

275. It appears from POPOFF's observations that the nuclei of

the fasciculi teretes are, even in the region* of the hypoglossal nuclei, sharply defined by means of thin fibres, some of which are transverse, some oblique, and some longitudinal. In places the bundles can be seen to arise from the dorsal decussation of the rhaphe. The fibres of the conductor sonorus are probably of the same origin as the fibres which are connected with the auditory fasciculi. They gradually get farther and farther from the rhaphe, and at the lateral angles of the fourth ventricle they join with the middle peduncles and pass with the latter to the cerebellum.

DUPUIS.

b.—NASO-PHARYNX.

276. ANTON, W. Contributions to our knowledge of Jacobson's organ in adults. *Zeitschr. f. Heilk.*, xvi., p. 355.

277. BROOM, R. On the organ of Jacobson in the Monotremata. *Four. of Anat. and Physiol.*, xxx., pp. 70-80.

278. SMITH, G. E. Jacobson's organ and the olfactory bulb in Ornithorhynchus. *Anat. Anzeig.*, xi., pp. 161-166.

B.—PHYSIOLOGY.

EAR.

279. EWALD, J. R. Upon the physiology of the labyrinth. Part iv. Relation of the cerebrum to the tonal labyrinth. From experiments by Ida H. Hyde. *Pflüger's Archiv*, lx., p. 492.

280. BERNSTEIN, J. Upon the hearing supposed to exist in doves deprived of the labyrinth. *Ib.*, lxi., p. 113.

281. WUNDT, W. Upon the question of the ability of doves to hear when deprived of the labyrinth. *Ib.*, lxi., p. 339.

282. KREIDL, A. Upon the perception of sound waves in fishes. *Ib.*, lxi., p. 460.

283. SCHÄFER, K. Arguments against Wundt's theory of the interference of auditory stimuli in the nerve-centres. *Ib.*, lxi., 544.

284. STERN, K. W. The literature in regard to the non-auditory function of the internal ear. *Arch. f. Ohrenh.*, xxxix., p. 248.

279. The rotation-movements of the head produced in doves by the removal of the labyrinth are after a while lessened by the development of compensatory phenomena. EWALD states that if

the cerebrum is removed before the labyrinth is operated upon, these compensatory phenomena are less apparent, and the labyrinthine symptoms themselves are increased. It would hence seem that, the greater the development of the cerebral centres, the more pronounced the compensatory symptoms would be. In consonance with this view it is found that, while in the frog these compensatory symptoms are almost *nil*, in man they are very marked—so much so indeed as to conceal in large part the symptoms due to destruction of the labyrinth.

ASHER.

280. BERNSTEIN finds that doves which have been deprived of the labyrinth show no auditory reaction to the report of a pistol or to loud sounds conveyed to the ear through a speaking-tube. They do, however, react to the sound of a whistle held five or six inches from them. As doves in which the auditory canals and tympana have been filled with plaster of Paris react in precisely the same way, the author concludes that doves deprived of the labyrinth do not really hear, and the apparent auditory reaction in the case of the whistle is due to the vibrations which the latter sets up in the body of the animal.

ASHER.

281. WUNDT believes in opposition to Bernstein (280) that doves deprived of the labyrinth are still able to hear.

ASHER.

282. KREIDEL believes that in goldfish the presence of a true auditory organ has not been demonstrated, but that they have a specially developed cutaneous sensibility which enables them to take cognizance of the sound waves.

ASHER.

283. SCHÄFER opposes the idea that binaural auditory impressions are fused in the nerve-centres. His view is based partly upon his own ingenious experiments already published, partly upon additional considerations which he now adduces.

ASHER.

284. STERN's paper is a valuable, although not perfectly complete, summary of the various articles that have been published in regard to the different functions, mechanical, static, acoustic, etc., that have been ascribed to the semicircular canals. The work is the more important, since it is becoming daily more and more evident how necessary an acquaintance with this department of otology is, as well from a diagnostic and clinical as from a physiological point of view.

E. BLOCH.

C.—PATHOLOGY AND THERAPEUTICS.

INSTRUMENTS AND METHODS OF TREATMENT.

285. SHASTID, THOS. H. A new myringotome. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.

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HARTMANN.

MISCELLANEOUS.

292. BARR, THOS. Giddiness and staggering in ear disease. *Br. Med. Journ.*, Dec. 28, 1895.

293 SCHEIBE, A. Some tumors of the ear. *ARCH. OF OTOL.*, xxiv., 3 and 4.

294. SNOW, SARGENT F: Aural, nasal, and laryngeal tuberculosis with special reference to the Adirondacks as a winter health resort. *Buff. Med. Journ.*, Dec., 1895.

295. KOSSEL, H. Investigations upon diphtheria and pseudodiphtheria. *Charité-Annalen*, x.

296. KOCH, P. Upon the effect of diving upon the ear. Jubilee Volume, prepared for the centennial of the Friedrich-Wilhelm Institute. Berlin, 1895.

297. BLAKE, C. J. The relation of an aural service to the needs of a general hospital for children. *The Children's Hospital Med. and Surg. Report.*, 1869-1894, Boston, 1895.

292. After dealing with the history of the subject, BARR describes aural giddiness as manifesting itself in four distinct forms :

1. True Ménière's disease.
2. Due to pressure upon the walls of the middle ear.
3. Due to pressure upon the walls of the external meatus or outer surface of the membrane.
4. Due to irritation of the auditory nerve.

He then considers the symptoms, causes, and diagnosis of true Ménière's disease, and cites four interesting cases. The paper is an extremely instructive one.

CHEATLE.

293. SCHEIBE reports a case of fibroma at the entrance of the ear canal in a man aged fifty-six, who had noticed a tumor growing in his left ear for six years. The tumor was removed with the galvano-cautery. Seven years later there had been no relapse. Other cases reported were one of pedunculated osteo-sarcoma of the ear canal, and three cases of hairy granulation tumor in the middle ear. Histological examinations are given in full of all the tumors which were removed.

BACON.

294. SNOW describes the usual symptoms of tubercular infection of the ear and larynx, and reports several cases of tubercular laryngeal disease, where the patients received much benefit from a stay in the Adirondacks. His conclusions are as follows :

First. That a thorough rubbing in of lactic acid, in the proper strength and at regular intervals, works nicely in allaying local tubercular ulcerations.

Second. That a continuous residence, or as near so as possible, with systematic bathing and exercise, in an altitude of from 1000 to 2000 feet, together with a porous soil and adjacent forests, will greatly benefit and perhaps cure even quite advanced tubercular manifestations.

Third. That we have here at home, in the Adirondacks of our own State, localities where many tubercular patients may find the climatic and physical environment required. In fact, his personal opinion is that they will receive more benefit there than from residence in Florida, and fully as much as could be obtained in Colorado or Southern California.

Fourth. That the patients do equally as well in fall and winter, and gain more in weight than in summer months, hence we need not keep them at home for "spring to open," but should insist upon an immediate removal, when practicable, from unfavorable climatic influences.

BACON.

295. KOSSEL, like many previous investigators, concludes from his bacteriological experiments that there is no foundation for the idea that the true Bretonneau diphtheria can exist without diphtheria bacilli. The latter were absent in only 22 (8 per cent.) of the children brought in with the diagnosis of diphtheria; and of these 22 not one died. He was able to make cultivations of the bacilli from the discharge from the ear in two cases of otitis following diphtheria, and also in a case of scarlatinal otitis in which, although pharyngeal diphtheria existed, no bacilli could be found in the throat.

HARTMANN.

296. KOCH made a series of experiments upon divers of the German sea-service. They are required to be free from aural disease at the outset, and receive a graded course of instruction in their art. Koch found the effects of diving upon the ear to be somewhat different from those produced by the action of compressed air (in caissons and the pneumatic cabinet). These effects comprise:

(A) *Subjective sensations.* Of these the most marked are (1) *pressure sensations on descending.* These usually begin at a depth of 2 metres, are always present at a depth of 4 metres, and often are of such intensity as to constitute a stabbing pain. Practice diminishes them. They are due to a pressing-in of the drum membrane, are relieved by the act of swallowing, and also cease as soon as the diver touches the bottom. (2) *Sensations in ascending* are less marked, indeed usually absent. This is proba-

bly due to the fact that the construction of the Eustachian tube facilitates the escape of air from the middle ear. (3) *Sensations after emerging* comprise a feeling of dulness and deafness in one or both ears.

(B) *Objective changes* include (1) *mechanical changes*, the chief of which are depression of the membrane with prominence of the ossicles. Exceptionally, Shrapnell's membrane is found to be bulging. (2) *Vasomotor changes* comprise hyperæmia (which may persist for weeks), transudation into the middle ear, and epistaxis. (3) *Disturbances of hearing* occur directly after the immersion, but are not permanent.

(C) *Pathological changes* are very rare. They include (1) *rupture of the drum membrane*, one case; (2) *otitis media*, one case (caused by the propulsion of mucus from the Eustachian tube into the middle ear); (3) *hæmorrhage* into the labyrinth or acoustic centres. No case of this lesion is known to have occurred.

The author concludes that (1) persons with organic closure of the tube, or with either large cicatrices or marked atrophy of the drum-membrane should be excluded from this form of service. (2) That diving should be intermitted, in case of acute swelling of the tube or of coryza or pharyngitis, where there is danger of infectious matter being driven from the throat into the ear. (3) Practice must be suspended if tinnitus, not disappearing in a short time, recurs after each immersion. (4) Swallowing is the remedy for pain in the ear produced by diving. (5) Stopping the ears is perfectly useless. [The Reviewer's experiments with the pneumatic cabinet show that the effects of over-pressure are most readily relieved, the slighter the latter is, and that when the latter is marked, it is difficult to open the tubes. It would seem therefore advisable to direct divers to make a swallowing movement as soon as they begin to go down.] HARTMANN.

297. For the five years ending in 1893, there were forty-two ear cases treated at this hospital. This number does not, however, include the cases in which the ear trouble was secondary to, or a complication of, some other disease for which the patient was admitted. BLAKE says that "the importance of having an aural surgeon as one of the consulting staff of such an institution as the Children's Hospital has been sufficiently demonstrated during the last five years, and is evident on consideration of the frequency with which the ear is implicated in the course of the

contagious diseases of childhood, the rapidity with which such implications run a destructive course in many cases, and, consequently, the importance of prompt attention." The writer believes that much of the treatment in both the acute and chronic diseases of the ear may advisedly be left to an intelligent nurse, properly instructed, and the wards of the hospital afford an excellent opportunity for teaching. It is proposed to offer, in the Aural Department of the Massachusetts Charitable Eye and Ear Infirmary, a short special course on the examination and diagnosis for the house officers of the Children's Hospital, as preliminary to their entering upon their hospital duties.

BACON.

EXTERNAL EAR.

298. SZENES, S. Upon a rare case of external otitis of infectious origin. *Ann. des mal. de l'oreille, etc.*, No. 8, 1895.

299. HUTCHINSON, J. On erosive inflammation of the external ear. *Arch. of Surg.*, Oct., 1895.

300. RICHARDSON, C. W. A case of living larvæ in normal auditory canals. *ARCH. OF OTOL.*, xxiv., 304.

301. ADAMS, A. E. A foreign body in the auditory canal. *Trans. Am. Otol. Soc.*, 1895.

302. MOURE, E. J. Cavernous angioma of the ear. *Rev. de laryngol.*, No. 23, 1895.

303. COURTADE, A. Case of occlusion of the auditory canal; operation. *Ann. des mal. de l'oreille, etc.*, No. 12, 1895.

304. CORRADI, C. Perforation of the drum-membrane from indirect causes, considered particularly from a medico-legal standpoint. *Arch. f. Ohrenh.*, xxxix., p. 287.

305. MATTHEWSON, A. Subsequent history of a case of aural exostosis, first operated on in 1876. *Trans. Am. Otol. Soc.*, 1895.

306. GREEN, J. ORNE. Cartilaginous exostoses of the ear, *ib.*, 1895.

299. HUTCHINSON believes that most of the erosions of the external ear are of the nature of frost-bites, although some are lupous in character. He reports three interesting cases.

CHEATLE.

300. RICHARDSON reports the case of a feeble infant, aged four months, who had never been sick, but who suddenly became

very peevish, cried almost continuously, and took very little nourishment. Three days later a slight bloody discharge appeared in the right auditory meatus. An examination showed the presence of a living worm in the right canal, which was removed with the forceps. Two large ones were likewise extracted from the left ear. The drumheads were intact.

BACON.

301. ADAMS reports the case of a child, aged three years, who, while holding the small end of a stick in her mouth, fell forward and struck the other end of the stick on the floor, driving the small end into the soft parts at the inner side of the ramus of the lower jaw on the right side. The stick was broken off, and the small end remained in the mouth. The projecting piece was removed by the mother, and measured about two inches in length. This was followed by profuse hemorrhage, and later by a discharge, and the child was unable to open its mouth to take solid food. Ten weeks later, a slight discharge appeared in the right external meatus. A piece of the stick half an inch long was removed by forceps from the auditory canal. The patient made a good recovery with apparently normal hearing.

BACON.

302. The tumor which MOURE removed from a woman forty-seven years of age, was a dark-red polypoid growth, arising from the postero-superior wall of the drum-membrane. It had a very large central cavity, and was filled with blood. Its removal was attended with considerable bleeding.

DUPUIS.

303. A boy, five and a half years old. The ear had been detached at birth by the use of the forceps. Suppuration persisted for four months, and one year after birth the canal was found to be completely closed. Three operations had been performed without result. COURTADE found a cul-de-sac extending 15 *mm* in from the tragus, and at the bottom of this a very narrow opening, passing into another cavity beyond, 7 *mm* long. Two incisions, one vertical, the other extending backward, were made through the whole length of the stenosed portion, and the canal kept open by a drainage tube 6 *mm* thick. Cicatrization in fourteen days, and permanent patency. The author advises in such cases the use of two flaps, with their bases respectively in front and behind, to cover the wound.

ZIMMERMANN.

304. CORRADI believes that ruptures of the membrane due to a fall or a blow upon the head usually lie in the peripheral part of the membrane or along the annulus tympanicus, while, as is known,

those due to a sudden change of the atmospheric pressure are generally found in the neighborhood of the umbo and the handle of the malleus. He tries to explain the reason for this difference, which may be of some importance from a medico-legal point of view.

BLOCH.

305. MATTHEWSON'S case was reported in the Transactions of the First Congress of the International Otological Society, 1876. The patient was seen at intervals, and up to 1885 there was no indication of return of the exostosis. In April, 1893, the meatus was found closed by an exostosis, filling it so completely that a probe could not be passed by it. There were also symptoms of pressure—headache, vertigo, and loss of hearing. An operation was performed for the removal of the growth by the dental engine. Instead of the "square drills," a drill known as the antrum drill was employed. This drill was found much more effective, both in perforating the growth and in enlarging the opening by lateral pressure. Up to date there has been no further trouble, and the hearing has been good.

BACON.

306. In addition to two cases of osteoma reported in the ARCHIVES OF OTOTOLOGY for July, 1893, GREEN adds another one. N. W., a man, aged twenty-one, in robust health, had pain in the right ear five months previously, with discharge, which continued up to his entrance in the infirmary. There was at this time a profuse discharge, and a large immovable tumor completely filled the meatus nearly to its orifice. Its insertion was apparently deep in, but could not be made out accurately. The surface of the tumor was normal skin. No perforation whistle was heard on inflation. Under ether, the auricle was turned forward and the cartilaginous separated from its attachment to the osseous meatus. The tumor was seized with forceps and by a rotary motion and considerable force was extracted without further cutting of either soft or osseous parts. The growth had evidently been attached in the tympanum or attic and these cavities were filled with pus, detritus, etc., which were removed. The auricle was replaced and stitched in position. Several months later, when examined, the drumhead had healed and the hearing was the same in each ear. The tumor removed was 15 mm long, and 12 mm wide. It was slightly nodulated and covered with a uniform thin glistening layer of cartilage, except at the point of insertion. It was composed of bone with a thin cortex and fine spongiosa within.

BACON.

MIDDLE EAR.

307. BLAKE, C. J. A foreign body forced into the middle ear. *Trans. Am. Otol. Soc.*, 1895.
308. ALDERTON, H. A. A cicatrix of the membrana tympani vibrating synchronously with the respiration and the pulse. *Annals. of Ophth. and Otol.*, Oct., 1895.
309. KOERNER, O. A new type of influenza otitis. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.
310. HOLINGER, S. Mastoiditis and sinus-phlebitis after influenza. *Chicago Med. Recorder*, Dec., 1895.
311. TANSLEY, J. O. Acute attic disease and its treatment. *Trans. Am. Otol. Soc.*, 1895.
312. SZENES, J. Should we pronounce for or against opening of the mastoid in acute cases? *Ann. des mal. de l'oreille, etc.*, No. 10, 1895.
313. VOSS. The treatment of facial paralysis following acute otitis media. *Arch. f. Ohrenh.*, xlix., p. 285.
314. KNAPP, H. On the indications for mastoid operations in acute purulent otitis media, with four illustrative cases. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.
315. BURNETT, C. H. The prevention of mastoid empyema. *Trans. Am. Otol. Soc.*, 1895.
316. BUCK, A. H. The prognosis of operations upon the mastoid process of diabetic persons. *Ib.*, 1895.
317. BLAKE, C. J. Two illustrative cases of antrum disease. *Ib.*, 1895.
318. HOLT, E. E. Two cases of otitis media suppurativa. Necrosis of the mastoid. Operation. Death. *Ib.*, 1895.
319. GRÜNWALD. Contributions to aural surgery. *Deutsche med. Wochenschr.*, Nos. 45, 46, 47, 1895.
320. REINHARD, E. The operation of opening the cavity of the middle ear. Greifswald, 1895.
321. MANN. Von Mangold's method of transplanting flaps after radical operations done for chronic suppuration of the middle ear. *Deutsche med. Wochenschr.*, No. 48, 1895.
322. LEUTERT, E. Pathologico-histological contribution to the cholesteatoma question. *Arch. f. Ohrenh.*, xxxix., p. 233.
323. WOODS, R. H. A case of purulent otorrhœa of seven

years' standing with cerebral complications. *Med. Press*, Nov. 20, 1895.

324. TREITEL. A case of multiple otitic cerebral abscess. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.

325. MOSS, R. E. Two cases of otitic brain-disease. *Ib.*, xxiv.

326. BARR, T. The treatment of intra-cranial abscesses following purulent diseases of the ear. *Ib.*, xxiv., Nos. 3 and 4.

327. ROMENY, M. B. Cerebral affections in otitis media. *Med. Weekblad*, April 20, 1895.

328. GREEN, J. O. Circumscribed periphlebitis of the jugular due to mastoiditis. *Trans. Am. Otol. Soc.*, 1895.

329. BURNETT, C. H. Aural notes in a case of intra-mastoiditis with perforation of the medial plate of the process and burrowing of pus into the post-pharyngeal region. *Phil. Polyclinic*, Nov. 23, 1895.

330. TARGETT, J. H. Excision of temporo-maxillary joint for ankylosis following otorrhœa. *Br. Med. Journ.*, Nov. 23, 1895.

331. LICHTHEIM. Upon the diagnosis of meningitis. *Berl. klin. Wochenschr.*, No. 13, 1895.

332. FÜRBRINGER, P. Upon the clinical significance of puncture of the spine. *Berl. klin. Wochenschr.*, Nov. 18, 1895.

307. A boy aged ten years thrust a foreign body into the left ear. Two attempts at extraction had been made by local practitioners, but without result. On examination, BLAKE found a hard, round, black body. Under ether two attempts to remove the body were unsuccessful. The auricle was then deflected forward and the soft tissues dissected away from the posterior wall of the canal. It was necessary to break off one tip of the object before it could be drawn out. The foreign body proved to be a piece of gas carbon, having a smooth, rounded surface on one side, and being on the other rough and concave.

BACON.

308. ALDERTON's patient, a man sixty-four years of age, complained of deafness in both ears with tinnitus for three years. Besides thickening and retraction of the drumheads on both sides, the right membrana tympani exhibited a cicatrix anteriorly and inferiorly. After the act of swallowing, the cicatrix vibrated synchronously with the movements of respiration. Shortly the air

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TMANN.

made with but one horizontal incision combined, if necessary, with a vertical one. NOLTENIUS.

320. REINHARD gives a full account of the history of the operations for exposing the tympanic cavity, beginning with the original mastoid operation as performed by Petit, Morand, and Jasser, then describing fully Schwartz's operation, and lastly the more recent methods of Küster, v. Bergmann, Zaufal, Jansen, Stacke, Stacke and Schwartz, Körner, Siebenmann, Kretschmann, and his own. He then describes ten cases that were operated upon. It is not apparent that an adequate attempt was made to cure the cases by ordinary measures before an operation was resorted to.

Case 9 was in a tuberculous patient, with chronic offensive discharge, headache, and tenderness of the mastoid. The latter, when chiselled, was found to be destroyed down to the dura, which was studded with granulations and tubercles. The process was so extensive that the operation practically amounted to a total resection of the mastoid. A subsequent operation was required, in which the attic was laid open, and its contents removed. The case resulted favorably.

Case 10 was that of a patient with acute otorrhœa, headache, and retro-auricular pain. The entire mastoid was extremely tender to pressure, and later also became reddened and infiltrated. On making the cutaneous incision there was marked venous bleeding, and, when the mastoid was opened, it was found to be reddened and discolored, and contained offensive pus. As the attempt was made to remove a piece of necrosed bone, a pulsating jet of venous blood, as thick as the thumb, spurted out. This was controlled by digital compression and a tampon, and when the dressing was changed five days later there was no bleeding. Three days after this the temperature suddenly rose to 40° C., there was violent headache, and a hard swelling appeared along the course of the jugular vein. The sinus was exposed, and found to contain a little blood and a thrombus which showed purulent discoloration. No attempt was made to ligate and open the jugular. Three weeks later chills, stupor, delirium, and death. HARTMANN.

321. MANN scrapes the carefully cleaned skin of the forearm with a sterilized razor, removing the cutaneous tissues down to the papillary layer, and transfers the mixture of epidermis and blood to the raw surface that he wishes to cover. This latter

must have all granulations and blood removed from it. A strip of protective is placed over the epithelial graft to prevent evaporation, and to keep the graft from sticking to the dressing. The author applies this method to the raw surface made in the cavity of the middle ear by operation, and believes that he can by this means secure epidermization in three weeks, provided that all morbid matter has been actually removed before the graft is applied.

NOLTENIUS.

322. LEUTERT, in harmony with the prevalent notion as to the origin of cholesteatoma, attempts to prove that the latter is not the result of inflammatory over-growth of the epidermis which penetrates into the middle ear, but is due to the formation of retention-cysts. In support of this idea he cites one case of a man who had been operated upon four years before, and in whom a small cholesteatomatous pearl was found completely encapsuled in a dilated pneumatic cell. The epidermis was separated from the epidermoidal matrix of the tumor by a thin layer of connective tissue, so that the growth presented an instance of a retention-cyst like those which have been observed or have been experimentally produced in other parts of the body by Kaufmann and others. Structures of this character may, for reasons readily intelligible, be found as recurrent growths after operations: but they may also occur primarily in the course of chronic suppuration. In any case, the author's observations support the theory that cholesteatoma is due to the fact that pavement epithelium makes its way through perforations in the drum-membrane into the tympanic cavity, where then it continues to develop. It then makes very little difference whether the masses of desquamating, cornified epithelium are pent in and kept from escaping from the mastoid by bony walls or by a soft layer of cutaneous tissue which encloses them.

BLOCH.

323. In WOODS's case the antrum was found full of pus and granulation tissue with cholesteatomatous debris. An extra-dural abscess, with sinus-thrombosis and a temporo-sphenoidal abscess were also found. The patient was doing well.

CHEATLE.

324. TREITEL's case was that of a young man aged twenty-two years, who had had a chronic otorrhœa from scarlatina since childhood, and who developed grave cerebral symptoms. At the autopsy there was found an abscess in the lower surface of the right temporal lobe. There was also a large abscess in the poste-

rior portion of the temporal lobe and adjacent portion of the occipital lobe, together with several smaller ones farther behind in the occipital lobe. Mastoid sclerosed. BACON.

326. In this address at the International Otological Congress held at Florence in 1895, BARR reviews in detail the history of operations on the cranial cavity following diseases of the ear. He describes the methods of operating and he discusses the various cranial complications, viz.: extra-dural abscess, septic thrombosis of the sigmoid sinus, intra-dural abscess, cerebral and cerebellar abscesses, and mixed cases of intra-cranial disease.

BACON.

327. ROMENY gives a description of an abscess developing in the temporal lobe in a chronic otitis media of the same side. On operation offensive pus was evacuated, but the patient died. A minute perforation of the tegmen tympani was found on autopsy and a communication between the tympanic cavity and transverse sinus.

MEYJES.

328. GREEN reports a case of a young man aged twenty-eight years, who was first seen July 1, 1891, and who gave a history of having had typhoid fever five weeks previously. At the beginning of the so-called typhoid, there was pain and swelling behind the right ear, which gradually extended down the neck just in front of the sterno-cleido-mastoid muscle. Ten days before his admission there was a slight chill, and a few days later a rigor. An examination showed the usual symptoms of middle ear and mastoid disease and great tenderness along the anterior edge of the sterno mastoid muscle, but no indurated cord could be felt. The mastoid operation was performed and this afforded relief for a few days. Later he had a rigor, fever, and vomited. The neck was then examined and on opening the sheath of the jugular vein a few drops of pus were evacuated. There was no thrombus. From this time there was a speedy recovery.

BACON.

329. The case reported by BURNETT was that of a physician sixty-two years of age who had a chronic purulent otitis media of the left side which was further complicated by mastoid disease. A Wilde's incision liberated some pus and at the same time an incision was made into the attic through the membrana flaccida. After this, he returned to his home feeling well for a month. At the end of this time he found that his neck beneath the ear, in the line with the sterno-cleido-mastoid muscle was swollen and brawny, and that he could force pus through the aural meatus

both by distention of the buccinators and by pressure over the brawny region on the side of the neck beneath the ear. The bottom of the pus cavity was formed by the superior constrictor of the pharynx in this case. The floor of the auditory meatus was found to communicate with the post-pharyngeal collection of pus. An incision was made by the same surgeon behind and below the mastoid in the nuchal region and pus was evacuated. When seen by Burnett, the patient had pyæmic symptoms. The external auditory canal was narrowed. There was a remnant of the drumhead. Valsalvian inflation forced a few bubbles from the drum cavity as well as air and pus from the perforation in the cartilaginous floor of the meatus and from the perforation in the neck below and behind the mastoid. Dr. W. W. Keen operated on the patient and found a large odorless pus-cavity in the pharyngeal region, and which he evacuated through an incision beneath the jaw, the mastoid cortex being first removed and the antrum exposed. The patient recovered but with loss of hearing.

BACON.

330. At a meeting of the Hunterian Society TARCETT showed a boy aged five years with good movement of the jaw after excision of the temporo-maxillary joint; which had become ankylosed as a result of implication from middle-ear suppuration.

CHEATLE.

331. Starting with the assumption that there is no such thing as a purely cerebral or a purely spinal meningitis and that the communication between the various subarachnoid spaces must serve to effect the transportation of inflammatory germs and the dissemination of the inflammation itself along the cerebro-spinal axis, LICHTHEIM regards Quincke's puncture of the subarachnoid space as an important diagnostic aid in determining the presence of meningitis. For more than two years he has employed this procedure, using it in a number of cases, and in all but one he has by means of it succeeded in establishing the diagnosis. In the pus withdrawn by the puncture micro-organisms, particularly streptococci, but in one instance pneumococci, could always be readily demonstrated by cultivation or staining. In one case of traumatic meningitis the fluid withdrawn by the puncture, although turbid, contained no micro-organisms, although the circumscribed infiltrations of pus in the pia contained numerous streptococci. In tuberculous meningitis the method is particularly valuable, since tubercle bacilli were always present in the

aspirated fluid. The bacilli, to be sure, are usually scanty, and the fluid is generally to all appearances quite clear.

In conclusion Lichtheim states that the method is readily applicable and free from danger, although not of course to be employed without taking proper aseptic precautions.

VON WILD.

332. FÜRBRINGER has employed Quincke's puncture in 86 cases. His method differs somewhat from that of Quincke himself in that he places the patient in a sitting posture and introduces the needle in the median line and precisely at the level of the spinous process of [one of the lumbar] vertebræ. The quantity of fluid evacuated may vary from a few drops to 100 *cu. cm.* In 37 cases of tuberculous meningitis he found tubercle bacilli in 30. The bacilli are usually found in the fibrinous coagula contained in the fluid.

As a means of diagnosis this procedure is of the highest value ; as a therapeutic measure it seems to be of little account.

VON WILD.

INTERNAL EAR.

333. WEST, SAMUEL. Case of cerebral tumor in which the initial symptoms were chiefly sensory in the arm and face. Sudden aggravation with loss of hearing in corresponding ear. *Brain*, pts. lxx. and lxxi., 1895.

334. SCHEIBE, A. Anomalies of formation of the membranous labyrinth in deaf-mutism. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.

335. SCHEIBE, A. A histological contribution to deaf-mutism due to otitis interna. *Ibid.*, xxiv., Nos. 3 and 4.

336. LEMARIEY, A. Ménière's syndrome cured by pilocarpine. *Ann. des mal. de l'oreille, etc.*, No. 11, 1895.

333. WEST's case was that of a boy aged sixteen years, who shortly before death had loss of power in the left arm and leg with deafness in the left ear. The notes as regards the aural symptoms are unfortunately very vague, the author only stating that "he could only hear a watch one inch away with the left ear, while the hearing on the right side was fairly acute." At the post-mortem a tumor (gliosarcoma) the size of a walnut was found lying in the white matter on the outer side of the lenticular nucleus, surrounded by softening which extended backwards into the occipital lobe and downwards somewhat into the temporo-sphenoidal lobe.

CHEATLE.

334. SCHEIBE reports the results of an anatomical examination in the case of a deaf-mute, aged eleven years, who died after a six-weeks' illness from scarlet fever and dropsy. As a result of his examination and of others made by him, he concludes that "in all cases heretofore published the malformation of the labyrinth involved the osseous capsule. Our case shows that an arrest of development may be confined to the membranous labyrinth, the osseous portion being normally formed." BACON.

335. The case reported by SCHEIBE was that of a boy eight and a half years old, who died from scarlet fever with diphtheria. He became deaf in his fourth year from a brain disease. There was no heredity in his case. A post-mortem examination was made the day after death. A histological examination was made of both temporal bones. In both ears a recent otitis media was the result of scarlet fever with diphtheria during the weeks immediately preceding death. The destructions in both labyrinths were of older date and sufficed to account for the deafness, that led to deaf-mutism. They were to be considered as sequels of inflammation. BACON.

336. In LEMARIEY's case of Ménière's disease, the use of pilocarpine increased the hearing distance from 25 to 100 *m* and abrogated the vertigo and tinnitus. Relapses occurring respectively one and three months later were cured by quinine

ZIMMERMANN.

NOSE AND NASO-PHARYNX.

337. THOMPSON, ST. CLAIR, and HEWLETT, P. T. Micro-organisms in the healthy nose. ARCH. OF OTOL., xxiv., Nos. 3 and 4.

338. OTT, C. Upon changes of the lips due to mouth-breathing of long standing. *Arch. f. Laryng.*, ii., 3.

339. GUYE, A. A. G. Upon the occurrence of a dental calculus upon the incisor tooth as a result of habitual mouth-breathing. *Tydschr. voor Geneesk.*, No. 6, 1895.

340. COLLIER, M. Some effects of chronic nasal obstruction. *Med. Press and Circ.*, Nov. 20, 1895.

341. MACDONALD, GREVILLE. Spasmodic asthma and nasal troubles. *Br. Med. Jour.*, Nov. 7, 1895.

342. WALDOW, A. Investigations upon the malformations of the jaw due to obstruction of nasal respiration. *Arch. f. Laryngol.*, iii., p. 233.

343. SIKKEL. Upon the treatment of epistaxis. *Med. Weekblad*, No. 44, 1895.
344. FINCK, E. On hydrorrhœa nasalis. *Wien. med. Pressa*, Nos. 42 and 43, 1895.
345. HAMON DU FOUGERAY. A case of primary acute purulent rhinitis in an infant, due to staphylococci, and cured by the use of a 10 per cent. mentholated oil. *Ann. des mal. de l'oreille, etc.*, No. 12, 1895.
346. FAYE. Bacteriological diagnosis of ozæna. *Rev. de laryng.*, No. 19, 1895.
347. CHEVAL. Treatment of ozæna by interstitial electrolysis. *Fourn. de la soc. des. sc. méd., etc.*, (Brussels), No. 25, 1895.
348. WRÓBLEWSKI, L. Acute abscesses of the nasal septum. *Arch. f. Laryngol.*, ii., 3.
349. KRETSCHMANN. Upon the treatment of deflections of the nasal septum by means of the trephine. *Ibid.*, ii., 3.
350. RIPAULT, H. A case of confluent papilloma of the nasal fossæ. *Ann. des mal. de l'oreille, etc.*, No. 12, 1895.
351. STIEDA, A. Upon bone-cysts in the nose. *Arch. f. Laryngol.*, iii., p. 359.
352. STEWART, W. R. H. A very large fibroma of nasal septum. *Br. Med. Fourn.*, Dec. 28, 1895.
353. BIEHL. Upon the pathology of bleeding polypi of the septum. *Monatsschr. f. Ohrenh.*, No. 6, 1895.
354. LAVRAND, H. Fibro-mucous polyp of the left posterior naris, hanging down into the pharyngeal cavity and detached by way of the nasal fossa after malaxation. *Fourn. des sc. méd. de Lille*, Oct., 1895.
355. LUC. Upon the etiology of mucous polypi of the nasal fossæ. [Communication to the British Medical Association, 1895.]
356. WATSON, S. Case of nasal polypi associated with tachycardia. *Br. Med. Fourn.*, Nov. 2, 1895.
357. JULER, H. E., and SMALL, M. A. A case of acute orbital cellulitis following a dental abscess. *Ibid.*, Oct. 19, 1895.
358. DMOCHOWSKI, Z. Contribution to the pathological anatomy and the etiology of the inflammatory processes in the antrum of Highmore. Prize essay. *Arch. f. Laryng.*, iii., p. 255.
359. AVELLIS. Some brief clinical remarks relative to our knowledge of empyema of the maxillary sinus. *Ibid.*, ii., 3.

360. SNELL, S. Distention of the frontal sinus. *Clin. Sketches*, Nov., 1895.
361. RIPAULT, H. Three cases of empyema of the frontal sinus. *Ann. des mal. de l'oreille, etc.*, No. 11, 1895.
362. BROWN, W. H. A case of fracture of the ethmoid bone with basal meningitis. *Lancet*, Dec. 14, 1895.
363. TILLEY, H. Three cases of parosmia ; causes, treatment, etc. *Ibid.*, Oct. 12, 1895.
364. STOKER, G. A method of removing naso-pharyngeal tumors to prevent bleeding from the pedicle. *Br. Med. Journ.*, Nov. 2, 1895.
365. BOYD, S. Temporary resection of the upper jaw for naso-pharyngeal tumors. *Ibid.*, Nov. 16, 1895.
366. PYE-SMITH, R. I. Canine tooth embedded in anterior wall of maxillary antrum for two years. *Ibid.*, Oct. 24, 1895.
367. DAAE, H. A supernumerary tooth which was found in the nose. *Arch. f. Laryng.*, ii., 3.
368. NEUMAYER, H. A case of tuberculosis of the buccal cavity, maxillary sinus, and nose. *Ibid.*, ii., 2.
369. MEYER, W. Adenoid vegetations, their prevalence and antiquity. *Arch. f. Ohrenh.*, xl., p. 1.
370. ANSLAU, Y. Statistical contribution to the study of adenoid vegetations of the rhino-pharynx. *Ann. des mal. de l'oreille, etc.*, No. 11, 1895.
371. SIKKEL, A. Acute infectious phlegmon of the pharynx. *Nederl. Tydschr. voor Geneesk.*, No. 21, 1895.
372. LICHTWITZ, L. A case of angioma of the pharynx. *Monatsschr. f. Ohrenh.*, No. 9, 1895.
373. LICHTWITZ, L. Upon the removal of hypertrophic tonsils by means of the hot electric snare. *Arch. f. Laryng.*, ii., 3.
374. RÉTHI, L. Upon the nature and etiology of spontaneous pharyngeal hemorrhages. *Wien. klin. Rundschau.*, No. 52, 1895.
377. THOMPSON and HEWLETT's results are summarized as follows : In all bacteriological investigations of the nasal fossæ a clear distinction must be made between the vestibule of the nose and the mucous cavity proper, as the former is lined with skin and is not part of the nose-cavity proper. Neglect of this distinction may account for the discrepancy in previous observations on the subject.

In the dust and crusts of mucus and débris deposited among the vibrissæ of healthy subjects micro-organisms are always found. On the Schneiderian membrane, on the contrary, the occurrence of pathogenic organisms is so infrequent that their presence can only be regarded as quite exceptional.

BACON.

338. OTT observed that in four mouth-breathers, in whom extreme nasal obstruction had existed for a long time, the mouth-breathing persisted even when the obstruction was removed. This he ascribes to the fact that the lips had become too short as a result of atrophy or insufficient action of the orbicularis oris, brought on by disuse. Systematic exercise, massage, and electricity are recommended as therapeutic measures. ZARNIKO.

341. In the course of a discussion on spasmodic asthma at the Harveyan Society, MACDONALD stated that of 30 cases of the disease associated with nasal troubles treated by him 20 were relieved, of which 12 were practically cured; 4 had septal deformities, 6 vascular turgescence of inferior turbinals, 4 polypi, 4 adenoids, and 2 œdematous swelling over the upper and anterior portion of the triangular cartilage. The remaining 10, which were not relieved, had polypi. CHEATLE.

342. WALDOW demonstrates the malformations of the jaw due to adenoid vegetations by means of plaster casts. He shows that these malformations must, as Körner says, be distinguished into two categories, viz., those occurring before and those occurring during the period of development of the permanent teeth. In the first period the palatal arch is dome-shaped and the longitudinal axis of the superior maxilla is elongated, but the teeth are normally placed; in the second period the palate forms a pointed arch, the jaw presents a V-shaped indentation in the median line, and the teeth are abnormally disposed. DUPUIS.

343. SIKKEL believes that the origin of epistaxis is in almost every case the anterior portion of the septum. The use of the anterior tampon, after a preliminary cauterization with chromic acid, has proved completely satisfactory in his practice. He does not use the liquor stypticus (solution of chloride of iron), since it fills up the nose with a dirty coagulum. Mackenzie's solution, on the other hand, has always proved reliable; and he speaks well of the hæmostatic action of oil of turpentine. MEYJES.

344. According to FINCK nasal hydrops, occurring independently of the presence of inflammatory germs, is a functional

neurosis of the terminal branches of the trigeminus, which supply the mucous glands of the nose and accessory cavities. In the presence of this neurosis any slight irritation will produce excessive secretion from the mucous glands. Removal of the hypertrophied extremities of the inferior turbinates produces no lasting effect. Finck recommends local treatment with exsiccant remedies such as aristol.

POLLAK.

345. HAMON DU FOUGERAY's patient, a boy of thirteen months, had rhinitis with much purulent discharge from the nose, high fever (40° C.), vomiting, and prostration of the most serious character. The pus contained the staphylococcus albus and aureus. The application of a ten-per-cent. solution of menthol in oil six times a day to the nose and throat effected a cure.

ZIMMERMANN.

346. In cover-glass preparations made from the secretion of ozæna FAYE found, besides Löwenberg's microbe, numerous other bacteria. He differs with Löwenberg as regards the odor exhaled by cultures of the ozæna bacillus, which, Faye says, is very unpleasant, like that of bed-bugs. The bacillus, according to Faye, is found not only in the nose, but also in the pharynx, larynx, trachea, and conjunctival sac. He thinks that it also probably gets into the blood-vessels. It is present only in true ozæna. In many animals injections of the cultures cause death.

DUPUIS.

347. Electrolysis, on account of its atrophying effect upon the mucous membrane, would *a priori* seem to be absolutely contra-indicated in ozæna, where the membrane and bony framework beneath are already reduced to a minimum. Nevertheless, CHEVAL found that of 90 cases of ozæna in hospital practice, 70 were cured in one sitting and 12 after several applications; 1 very severe case was improved after six applications separated by intervals of two weeks and three months; 2 were unimproved, 2 failed to return, and 3 were still under treatment. This gives 90 per cent. of cures. The average length of treatment is two weeks. The treatment gives the patient very little inconvenience. Cheval uses silver needles.

DUBAR.

348. WRÓBLEWSKI has observed as many as 14 abscesses of the septum, of which 6 were due to injury, 1 to typhus, and 1 to small-pox, while 5 were of the so-called idiopathic variety. Besides giving an account of these cases he considers the origin, diagnosis, and treatment of the conditions in general. He was

fortunate enough never to meet with a perforation of the septum from this cause ; but observed that if a large part of the cartilage is lost, external disfigurement (sinking in of the bridge of the nose) is very apt to occur.

ZARNIKO.

349. KRETSCHMANN, having tried Spiess's operation in 25 cases, pronounces it satisfactory. In 4 cases he had severe secondary hemorrhage, which required the application of the posterior tampon. Recently, therefore, he has, twenty-four hours after the operation, applied a tampon of iodoform gauze.

ZARNIKO.

350. In RIPAULT's case (a man thirty-six years old), there was a papilloma extending from the right nasal orifice 2 *cm* into the cavity of the nares and completely occluding the latter. Removed with sharp spoon and cauterized with lactic acid.

ZIMMERMANN.

351. In STIEDA's first case (a girl sixteen years of age), the whole right side of the nose was blocked up by means of two bone-cysts, one having the size of a hen's egg, the other that of a cherry. These communicated with each other and were filled with pus. The mucous membrane covering these cysts exteriorly was like the nasal mucous membrane ; the interior mucous membrane was destitute of mucous glands, was provided with both ciliated and pavement epithelium, and showed a few small polypi. The bony wall of the cyst was lamellated, covered outside and in with periosteal connective-tissue fibres, and presented evidences of active growth in the shape of osteoblasts. In the second case (a girl of nineteen), a bone-cyst projected from each middle turbinated. The exterior mucosa was quite thick, and there was marked proliferation of the mucous glands. In the vessels both intima and adventitia were much thickened.

DUPUIS.

352. At a meeting of the Laryngological Society of London, held December 11, 1895, STEWART showed a fibroma which measured 4 by 2½ by 1½ inches. The upper jaw had to be turned back to allow room for removal. This is the largest fibroma of the nasal septum which has yet been recorded. The operation was performed by Macready.

CHEATLE.

353. BIEHL describes two cases of "bleeding polypi of the septum," one in a girl of nineteen, the other in a woman of forty-seven. The tumors, which in both cases sprang from the anterior wall of the septum, consisted essentially of cavities varying in size and filled with blood, and of blood-vessels, surrounded by sparse connective tissue and covered with cylindrical or pavement

epithelium. They are, therefore, to be regarded as cavernous angiomata.

DUPUIS.

354. LAVRAND, after removing polypi from the nose of a child of fourteen, found behind the latter a firm, movable, pear-shaped tumor attached to the top of the left middle turbinated and extending backward into the naso-pharynx, where it more or less completely occluded both choanæ. The tumor could not be removed directly owing to lack of space to operate in. Lavrand then sought to diminish its size by malaxation (kneading) as recommended by Waquier. This he succeeded in doing in spite of the resistant character of the tumor, and then succeeded in grasping the latter with the polypus forceps and in pushing it back into the naso-pharynx, from which it was expectorated by the patient.

DUBAR.

355. LUC, after briefly considering, first, the theories of Ziem, who lays stress upon the frequency with which nasal polypi co-exist with suppuration in the sinuses, and, second, the connection, alleged by Woakes to exist between nasal polypi and necrosing ethmoiditis, contests the right of the latter disease to be regarded as a morbid entity. He also speaks of the co-existence of polypi with veritable new growths. According to his ideas, the frequency with which polypi occur in the region of the middle turbinated, the middle meatus, and especially the meatus semilunaris, is due to the fact that in these situations the mucous membrane is more full of folds and depressions than upon the lower turbinated. This favors the development of a pediculate tumor whenever œdematous distention (which is the first stage of myxomatous degeneration) occurs in these spots, while in places where there are no such folds the same process results in the formation of a diffuse swelling.

DUBAR.

356. In SPENCER WATSON's case the tachycardia was completely cured after the removal of polypi from both nasal fossæ.

CHEATLE.

357. In the Section of Ophthalmology at the meeting of the British Medical Association, JULER and MORTON SMALL read the notes of a case in which the eye was lost owing to acute chronic orbital cellulitis, the inflammatory process having extended through the antrum of Highmore from an abscess at the root of an upper molar tooth.

CHEATLE.

358. DMOCHOWSKI considers the true shape of the antrum of Highmore to be that of an irregular cube, having therefore six

sides, viz., an upper, lower, anterior, posterior, internal, and external. After an exhaustive review of the literature of the pathology of the cavity he describes his own results as obtained from the examination of 152 cadavers. In 28 of these the mucous membrane showed morbid changes, including 12 cases in which there was suppuration. He also examined 6 cases in which pus could be withdrawn from the antrum by paracentesis. On the basis of these observations he gives the following classification of antral diseases :

1. Acute catarrhal inflammation.
2. Chronic catarrhal inflammations with their sequelæ (cysts, polypi, osteomata, hydrops, inflammations).
3. Purulent inflammation, acute and chronic.
4. Diphtheritic inflammations.
5. Specific inflammations (syphilitic, tuberculous).

In the 18 suppurative cases he found besides various non-pathogenic microbes the following : *Staphylococcus pyogenes aureus* (3 cases), *Bacillus pyogenes foetidus* (10 cases), *Streptococcus pyogenes* (3 cases), *Pneumococcus* of Friedländer (2 cases), *Bacillus pyocyaneus* (1 case).

DUPUIS.

359. AVELLIS's article shows how varied may be the symptoms due to empyema of the maxillary sinus. They include obstinate gastric disease, due to swallowing of the fetid pus ; a sensation of something dropping down in the skull when the patient tried to sew, and painless œdema fugax of the cheek. The author further mentions a case in which, although the natural orifice was patent and irrigations were being performed, the empyema burst through the cheek, and a case in which cauterization of a spot in the vicinity of the ostium of the maxillary sinus produced an acute empyema of the latter, which was cured by perforating the canine fossa and making irrigations—five only of the latter being required. In conclusion he considers the chances of a spontaneous cure taking place in an acute empyema, and recommends that the cavity be entered as soon as the diagnosis is made.

ZARNIKO.

360. SNELL describes the symptoms of distention of the frontal sinus and gives the notes of two cases. In each there was a swelling at the inner orbital angle. Recovery occurred after opening at the site of the swelling and the establishment of free communication with the nose. He states that few cases occur under twenty years of age, as in children the sinus is not developed.

CHEATLE.

361. RIPAULT describes three cases of empyema of the right frontal sinus (in the third case the left sinus being also affected by perforation of the septum). In the first case there were nasal obstruction with discharge from the nose, a polypus recurring repeatedly after removal, headache, epileptiform attacks, transient swelling of the upper lid, and simultaneous empyema of the maxillary sinus. Cured. In the second case the nose was normal, but there was exophthalmus with complete atrophy of the optic nerve, and there were fistulæ proceeding from the sinus, which was filled with fungous masses. Cured. In the third case there were nasal occlusion from a sarcoma, fistulæ at the inner edge of the orbit, infiltration of the upper lid, and exophthalmus. Death from meningitis of the convexity. The author's plan of treatment in cases of frontal sinus disease is to make a large opening, curette the cavity thoroughly, and drain into the nose.

ZIMMERMANN.

362. At the Leeds and West Riding Medico-Chirurgical Society, November 29, 1895, BROWN showed a boy aged sixteen years who had received a blow on the occipital region, fell forwards, and struck his forehead violently on the ground; on the third day after the fall a copious discharge ran from both nostrils and continued for six days; and although he was extremely ill with meningitis, he eventually recovered.

CHEATLE.

363. In TILLEY's three cases of parosmia, the first followed influenza and was cured by nerve-tonics and intra-nasal spray of strychnine solution \mathfrak{M} x ad $\mathfrak{3i}$ applied daily; the second complained of the constant smell of tallow candles for which no cause could be found; and the third, a climacteric woman, complained of a foul smell in the nose also with no recognized local trouble.

CHEATLE.

364. STOKER's method consists in first applying a ligature of whipcord as close to the base of the tumor as possible through the nose, the whipcord being tightly twisted by means of an instrument which he has invented for the purpose; the tumor is then removed by the ordinary means below the ligature, which remains in situ for as long as is thought necessary.

CHEATLE.

365. At a meeting of the Medical Society of London, held November 11, 1895, BOYD showed a man aged forty-nine whose superior maxilla he had temporarily resected for the removal of a naso-pharyngeal tumor which was found to be growing either

from the base of the skull or front of the spine, and had blocked and bulged the right nostril and displaced the right eye.

CHEATLE.

366. In PYE-SMITH's case the tooth had been displaced owing to a kick at football, and a sinus had existed ever since; healing occurred after operation.

CHEATLE.

367. A woman, fifty-three years of age, suffering from ozæna, had in the floor of her left nasal fossa a supernumerary tooth, which DAAE removed. The germ of this tooth had evidently slipped from the oral into the nasal cavity before the time of closure of the palatal fissure.

ZARNIKO.

368. NEUMAYER reports the case of a man, thirty-seven years of age, affected with phthisis pulmonalis, in whom the extraction of the first molar tooth led to tuberculous infection of the gums, the buccal mucous membrane, the hard palate, and the mucous membrane of the maxillary sinus (which was opened by the extraction of the tooth); from the sinus the infection spread to the nose. The diagnosis was confirmed by the microscopical examination of the granulation masses excised from the gums and nose. Pharynx and larynx healthy. Sputum full of bacilli.

ZARNIKO.

369. Although some of the earlier rhinologists, such as Czermak, Türck, Semeleder, Voltolini, and Löwenberg, had observed adenoids by rhinoscopy, MEYER was the first (in 1867) to prove that these tumors, which had been seen to occur so frequently, were of one and the same character, and also to prove their great significance. As to their prevalence they have been found in the Esquimos of Greenland, in the Indians of Dakota and Montana, in the white population of the United States, and in all European countries. In China they are frequent both among the Mongolian and the mixed (Portuguese and Chinese) races. They have also been observed in Siam and Sumatra and other islands of the Indian Archipelago. Whether they occur in the Ethiopian races is not known. Alike in Europe, Asia, and America, they are more frequently met with in cold than in warmer climates.

It seems quite certain from the delineation of their physiognomy and from various recorded facts, that the sculptor Canova and the Emperor Charles V. suffered from adenoids. Whether, as Potiquet assumes, Francis II. of France, who died in 1560, also had adenoids, is not so certain, although probable. We have no evidence to show that it existed among the ancient Egyptians

and the Greeks, but Meyer found in the Vatican three busts of the ancient Romans which presented all the marks of the adenoid physiognomy.

It redounds vastly to Meyer's credit that he should have been the first to point out the true significance of a disease so widely prevalent and which evidently has existed from ancient times. In so doing he became one of the greatest benefactors of the human race.

BLOCH.

370. ANSLAU found that of 4,080 patients, 10 per cent. had adenoids, and of these more than one half were operated upon. He operates in one sitting, using Moritz Schmidt's instrument and ethyl bromide as an anæsthetic.

371. SIKKEL believes acute infectious phlegmon of the pharynx to be due to a lesion of the mucous membrane of the pharynx with subsequent infection. He describes a case of this sort which, like all the others on record, ended fatally. Autopsy showed general purulent infiltration of the pharynx, œsophagus, and larynx. The cause of death was not asphyxia due to the laryngeal swelling—for tracheotomy was performed early,—but was the result of the general infection, evidences of which were found in the presence of albuminuria and of swelling of the spleen. Sikkel compares these cases with the infectious angina of the French, in which the typhoid symptoms and pharyngeal swelling are less marked, but in which the mucosa of the larynx is also implicated. Infectious phlegmon can scarcely be confounded with angina Ludovici. In the latter sodium salicylate has been used with success, but in acute infectious phlegmon of the pharynx all treatment is useless.

MEYJES.

372. LICHTWITZ in a girl of sixteen found between the tonsil and the posterior pillar of the fauces a brownish or bluish sessile, non-pulsatile tumor, having a nodular surface. Below, this was continued on the posterior wall of the pharynx where it formed a black macular patch. Only three similar cases (those of Crocker, B. Fränkel, and Loomis) are described in literature.

DUPUIS.

373. LICHTWITZ is an ardent advocate of the use of the galvano-cautery snare in removing the tonsils. He argues that the advantages of the snare over the tonsillotome are that it adapts itself better to the shape of the tonsil and prevents bleeding; while, as compared with galvano-puncture and electrolysis, it has the advantage of taking only a few seconds. A full description of the apparatus necessary is given in the original.

ZARNIKO.

374, According to RÉTHI, changes in the vessels (dilatation of pre-existing vessels, new formation of capillaries) play the chief part in the production of pharyngeal hemorrhage, although moderate degrees of stasis and acute relapses of catarrh, with consequent congestion and increase of vascular pressure, are also of moment.

POLLAK.

BOOK REVIEWS.

Dr. OTTO KÖRNER: Die Otitischen Erkrankungen des Hirns, der Hirnhäute und der Blutleiter. (The Otitic Diseases of the Brain, the Meninges, and the Venous Sinuses.) With an Introduction by ERNST VON BERGMANN. Second and Revised Edition. Johann Alt, Franfort-on-the-Main, 1896. Translation of the German review of Dr. ARTHUR HARTMANN of Berlin.

The fact that a second edition of this monograph was called for within a year is evidence that it has filled the want felt by both aurists and surgeons for a comprehensive treatise on the diseases of the brain which complicate suppurative otitis media. Whoever seeks information in this field, especially if he desires safe knowledge upon the questions which are associated with operative interference, is compelled to consult Körner's treatise; in no other publication can such a clear and complete presentation of the subject be found.

The first edition was reviewed by Knapp in the Jan.-April, 1894, number of these ARCHIVES. During the short period which has elapsed since then, the advance in our knowledge of the otitic diseases of the brain permitted considerable increase in the contents of the volume. The number of operations reported during this time had increased from 20 to 79 in cases of sinus-phlebitis, and from 55 to 92 in cases of abscess of the brain. This made it necessary to rewrite the chapters on these operations. Septic diseases have been separated from pyæmic, and separate chapters have been devoted to meningitis serosa and to meningeal hyperæmia with cerebral œdema—a picture of disease which had received but little consideration.

A review of the individual contents of the work could not possibly take the place of a perusal, and on this account is omitted.

Dr. VICTOR URBANTSCHITSCH : *Ueber Hörübungen bei Taubstummen und bei Ertaubung im späteren Lebensalter.* (Acoustic Exercises in Deaf-Mutism and in the Deafness of the Aged.) Urban and Schwarzenberg, 1895. Translation of the German review of Dr. ARTHUR HARTMANN of Berlin.

After having presented his experiences with acoustic exercises at various places, Urbantschitsch describes them in detail in the work before us. The cases of deafness and of deaf-mutism submitted by the author and the director of the Vienna-Döbling Institute for Deaf-Mutes at the meeting of Naturalists in Vienna, and seen by the reviewer as well as a large number of co-specialists, did not seem to justify the conclusion that acoustic exercises had really been productive of any remarkable results. The presentation of the theoretical views of the author in connection with his practical experiences will therefore be received with gratitude, since they include a comprehensive view of all questions bearing on this subject.

As the author remarks in the preface, the methodical acoustic exercises require indefatigable energy and patience ; this is, however, rewarded when we observe their favorable influences upon the disposition, the mental state, and the social life of the deaf.

The author's treatment is based upon the fact that in disease of the sound-conducting apparatus or of the sound-connecting apparatus, lack of sufficient excitation of the acoustic receptive power is gradually succeeded by an actual diminution in this power ; if the latter is excited methodically by "acoustic gymnastics," hearing can be improved even though the pathological conditions remain unchanged.

The chapter on the influence of methodical acoustic exercises upon the audition of deaf-mutes constitutes the main part of the book. It is prefaced by an historical review which shows that similar exercises have been tried now and then in institutes for deaf-mutes, but have not yet come into any very general use.

To review the method used by Urbantschitsch, even in part, would require too much space. Every aurist will be in duty bound to form his own opinion after a trial of the method ; for this purpose it will be necessary, however, for him to study the book. Besides vowels and words, the use of harmonics is an important feature of these acoustic exercises. The author records extensive observations on the forms of deafness, variations in relations to different tones, partial tone-deafness, absence of

musical sense, variations in the acuteness of hearing, acoustic exhaustion, psychic deafness, etc., as these exist in deaf-mutes.

According to Urbantschitsch, experience is necessary to decide whether audition can be influenced by the exercises; hence the latter are experimentally indicated in every case of congenital or acquired deaf-mutism. Among the cases of acquired deaf-mutism, Urbantschitsch was most successful in deafness after cerebro-spinal meningitis, scarlatina, typhoid, deafness due to traumatism, and in two cases of deafness following fright. In some of the cases in which there were favorable results from treatment, the deafness had existed twenty or thirty years. Even after the perceptive power has improved, so long as the usual external auditory impressions are insufficient to excite auditory sensations, the increased functional activity can only be maintained by a continuation of auditory excitation.

The results following methodical acoustic exercises are illustrated by sixty cases in the Vienna-Döbling Institute for Deaf Mutes, which cases had previously been reported. They are as follows :

	Before the use of acoustic exercises.	At the end of six months.
Traces of hearing in.....	32 pupils.	In 11 pupils.
Hearing for vowels in.....	22 "	" 21 "
Hearing for words in.....	6 "	" 16 "
Hearing for sentences in.....	—	" 12 "
	<hr/> 60	<hr/> 60

In addition to improvement in hearing, another practical benefit is the favorable effect upon the pronunciation of the deaf-mute; both effects contribute in facilitating intercourse between deaf-mutes and hearing persons.

Similar results can be obtained in severe or total deafness occurring in the aged. The audition of such individuals must be excited in the same manner and must be stimulated, in addition, by social intercourse, music, and the theatre.

An enumeration of cases forms an appendix to the book.

In regard to the limits within which we may expect acoustic exercises to be effective, we refer to the next review: Bezold's *Das Hörvermögen der Taubstummen*, (The Power of Hearing in Deafmutes).

DR. FRIEDRICH BEZOLD: *Das Hörvermögen der Taubstummen. Mit besonderer Berücksichtigung der Helmholtz'schen Theorie, des Sitzes der Erkrankung und des Taubstummen-Unterrichts. Für Aerzte und Taubstummenlehrer.* (The Power of Hearing in Deaf-Mutes. With especial reference to Helmholtz's theory, the seat of disease, and the instruction of deaf-mutes. For physicians and teachers of deaf-mutes.) J. F. Bergmann, Wiesbaden, 1896. Translation of the German review of Dr. ARTHUR HARTMANN of Berlin.

Otology has been advanced and enriched in every direction by Dr. Bezold's extraordinary industry and conscientiousness; the monograph under consideration is another illustration of what can be accomplished in the field selected by him. Exact observations upon the power of hearing in deaf-mutes, as conducted with the continuous series of tones arranged by Bezold, have advanced our knowledge of this condition to a considerable degree.

The author made it possible to carry on these observations in such an exact and complete manner by establishing an uninterrupted scale of tones embracing the limits of human audition. In examining the lower portions of the scale which can be perceived by the normal ear, Bezold uses large tuning-forks with adjustable clamps; eight tuning-forks of this character are used, ranging from C', with 32 V. to a'. By moving the clamps, every tone of the scale can be obtained and used in testing air-conduction as well as bone-conduction. Above a', the tests are made with two covered organ-pipes with movable pistons. These reach to the lower tone limits of Galton's whistle with which the highest tones are tested.

Regarding the method of examination, we must refer to the original. The observations showed that a large number of deaf-mutes hear a greater or lesser portion of the scale wonderfully well and for a surprisingly long period; that the limits beyond which there is no perception of the scale, are frequently very sharply defined; and that, in regard to the source of tones employed, the intensity exceeded by far the excitation threshold of the ear, within the limits in which it was at all sensitive to sound. The most interesting result of the observations was the very frequent occurrence of partial defects, in which sometimes the upper and sometimes the lower limits of tones were absent; sometimes single or multiple gaps or islands were found which showed no perception at all.

Bezold divides the remains of the power of hearing which he found in groups, as follows :

I. Islands in.....	28	Organs of hearing, or	17.7 %
II. Gaps in.....	28	" " " "	12.7 %
III. Defect of the upper half in	1	" " " "	0.6 %
IV. Defects of upper and lower ends of scale in.....	8	" " " "	5.1 %
V. Defect at lower end of scale above four octaves in....	18	" " " "	11.4 %
VI. Defect of lower end of scale below four octaves in....	33	" " " "	20.9 %
<hr/>			
Total.....	108	Organs of hearing, or	68.4 %

It was of especial importance to determine the relation between the remains or rests of hearing in the congenital and in the acquired forms of deaf-mutism. Concerning the latter form, we will notice only those observations which apply to active or to former cases of otitis media purulenta. In every case of this sort, there was a loss of perception of the upper portion of the scale, *i.e.*, for Galton's whistle, and in most cases also of a smaller or greater part of the scale below this pitch, down to three octaves. In two instances, a small portion in the middle of the scale represented by Galton's whistle had been preserved. Bezold considers this a corroboration of Helmholtz's theory, since it can be assumed that in otitis media purulenta there is implication of the labyrinth through the fenestræ, and on this account, the beginning of the lowest turns of the cochlea must be involved.

The speech-physiological investigations of Helmholtz, Oscar Wolf, and others have defined the pitch which belongs to vowels. The ability of deaf-mutes to hear vowels agreed with their power to perceive the corresponding pitch of tones. As a result of his investigations, Bezold came to the following conclusions :

"For the understanding of speech the only absolutely essential part of the scale which must be perceived is the portion included between the tones *b'* and *g'* ; in addition, it is necessary that the tones included within these limits must be perceived when of moderate intensity ; if the duration of hearing for these tones sink below a certain level, it becomes insufficient for the appreciation of speech. In every case in which there is bilateral loss of hearing for this portion of the scale, there will be loss of hearing for speech."

Exact observation of the objective signs, the data connected with the history of the case, and the examination of the hearing furnish valuable points for the diagnosis of the primary disease. The determination of the remains of hearing furnishes the rational basis for all instruction in speech in those cases of deaf-mutism which possess any hearing whatever. Bezold regards it as very improbable that the perception of tones can be improved or even called forth by the conduction of simple tones. The attempts made in the Munich Institute for Deaf-Mutes, often continued for a long time, did not show any certain effects. For acoustic exercises, only speech need be considered, and such exercises must be employed in suitable cases. In schools for deaf-mutes, the instruction must be arranged in three divisions: (1) For those who are absolutely deaf; (2) for those who have become deaf during late childhood and who have preserved some remains of speech; and, (3) for deaf-mutes with partial power of hearing.

In the above lines, we have considered only certain chapters of this instructive book, so as to indicate the nature of its contents. Whoever studies it, will find himself well repaid.

Dr. J. MICHAEL: Die Behandlung der Mittelohr-eiterungen. (The Treatment of Otitis Media Purulenta.) Volkmann's Collection of Clinical Lectures, New Series, No. 133. Translation of the German review of Dr. O. KÖRNER of Rostock.

It is a difficult task for a reviewer to do justice to a work which is founded upon a series of surprising and unproven statements which lead to faulty deductions and yet contain a grain of truth.

About the only value of the work lies in the statement that, in the operative era in which we now find otology, extensive operations are sometimes undertaken in cases in which minor operations might answer, or in which any operation might be unnecessary. This is a truth which no one will deny, especially those who have assisted in the advancement of modern aural surgery. Every aurist has operated upon cases, in which, later on, he realizes that surgical interference had been unnecessary. This is naturally associated with the difficulty or occasional impossibility of recognizing, with certainty, the seat, extent, and dangers of suppuration within the mastoid. It will be easily understood, that every one is influenced by the impressions received from his own cases, and that, having had unfortunate experiences as a result of the post-

ponement of surgical treatment in aural suppurations, he will incline thereafter to active interference. Man errs as long as he strives.

If Michael wished to oppose the "*furor operativus*" of modern aural surgery, which he certainly exaggerates, he ought not to have done so by means of a lot of vague statements, which are in part irresponsible and in part false. The proper method would have been to collect cases in which there had been excessive or unnecessary operating, obtaining such examples from his own experience or from literature, and presenting them accurately and in detail. Such a collection of cases might have been accompanied by his criticism, and he would certainly have received much credit for the work.

Instead of this, he opposes the entire system of operations in aural surgery. Even in the indications for paracentesis in otitis media purulenta acuta he differs from the views generally held at the present time. In such instances he reserves paracentesis for cases in which there is delay of the pus in the breaking through. In the acute otitis of influenza, which universal experience has proven frequently to lead to grave complications, he advises the *avoidance of paracentesis* and advises to prevent the breaking through of the pus, if possible, "*because in those cases which run their course without perforation, we may expect a better prognosis and a more rapid cure.*" This is naturally true of very mild forms. He evidently has not seen any severe cases and has not taken the trouble to become acquainted with them through literature.

Think of his operations upon the mastoid: "*We have re-entered,*" he says, "*the wild currents of Jasser's time*"—demonstrating either that he is not familiar with the indications and methods of Jasser, or that he is unacquainted with those of modern times. His hypothesis, that changes in temperature affecting the surface of the body cause a condensation or rarefaction of the air contained in the mastoid cells, and that this either fills these spaces or empties them, is original but fallacious. He advises waiting without operative interference "*until there are symptoms which point to severe inflammation of the bone, to involvement of the meninges, the brain, or the sinus, or to the occurrence of pyramia!*" In contrast to this, how correct is Jasser's warning, that the first sign of such complications should serve as the final warning to operate! This shows that Michael is not acquainted with the unfortunately great mortality after operations which are undertaken too late.

But this is not all. *According to Michael, modern aural surgery is directly responsible for the uncomfortably large number of cases of disease of the sinus and of abscesses of the brain which are "constantly" being published by certain aural clinics!* Of course, he furnishes absolutely no justification for this calumny and simply ignores the reports of such complications by authors who did not operate (Toynbee, von Tröltsch, Wendt). Left to themselves, *i. e.*, without operative interference on the part of a modern otologist, according to Michael, aural suppurations rarely lead to serious complications, and "the chances of the subject of an otorrhœa acquiring a fatal cerebral complication are much fewer than those of the healthy individual being attacked by pneumonia or tuberculosis." Of what possible benefit can such a statement be? It can only confuse those who are ignorant of Pitt's unchallenged statistics, which show that one out of every 158 cases of death is due to aural suppuration. We also find the old statement cherished by aurists who are indisposed to operate or ignorant of such procedures: "The chances of a fatal result from narcosis or other complications following prophylactic operations are decidedly greater than the chance of a fatal complication being added to a simple otorrhœa"—a statement which is just the opposite of what can be proven.

We may content ourselves with these extracts, which could, unfortunately, be continued. It is interesting to learn how it was possible for Michael to acquire such views. He operated upon the mastoid about fifty times. *"In all cases it was possible to remove the diseased area by means of the sharp spoon. I have never found any necessity for chiselling open the mastoid."* This would indicate that Michael has operated only in cases in which the pus had broken externally. What was the result of those cases in which the pus broke internally? Concerning these, he informs us that they fell into the hands of others for treatment, and that *"after a few weeks or months they were operated upon for serious aural complications with greater or lesser success."* Naturally, the active aurist is held responsible for the unfavorable course, and not the "conservative" otologist who carefully nursed the pus and the danger, until too late.

The question arises, whether it would not have been better to ignore Michael's work than to review it. Certainly not! It occupied a prominent position as a publication, and, unfortunately, there is still a number of aurists who are unwilling or

ignorant in the subject of operating ; these might hail the work as a welcome justification for their inactivity. Those aurists only have the right to discuss the indications for opening the mastoid who have had the opportunity of performing early and late operations in a large number of cases, and have thus been able to draw conclusions concerning the justification or non-justification for these procedures, and to publish such experiences.

Dr. OSCAR BRIEGER : **Klinische Beiträge zur Ohrenheilkunde. Mittheilungen aus der Abtheilung für Ohrenkranke im Allerheiligen-Hospital zu Breslau.** (Clinical Contributions to Otology. Reports of the Aural Division of All-Saints Hospital in Breslau.) J. F. Bergmann, Wiesbaden, 1896. Translation of the German review of Dr. OTTO KÖRNER of Rostock.

Just as in medical meetings we often get more from the personal expressions of the members than from periodicals and papers, we find in Brieger's unconstrained contributions more instruction than in many a good systematic text-book. The author has the advantage of having to present only that which is of immediate interest to him, and the reading of these contributions takes the place of personal discussion upon many of the disputed questions of the day. The value of the book is enhanced by the open and experienced manner in which the author presents his views, which, in certain instances, differ from those held by others.

We do not consider it appropriate to dilate upon the rich contents of the book. We do not wish to save any one the perusal of the work, but wish to recommend it most highly to all our colleagues. Nor do we want to touch upon the few points in which we do not agree with Brieger, for these would require the same extensive presentation which the author has accorded to them.

Dr. A. JANSEN : **Erfahrungen über Hirnsinusthrombosen nach Mittelohreiterung während des Jahres 1893.** (Experiences in Sinus Thrombosis Following Suppurating Processes of the Middle Ear during 1893.) Sammlung klin. Votr., N. Folge, 1895, No. 130. (Collection of Clinical Lectures, New Series, 1895, No. 130.) Translation of German review of Dr. E. BLOCH of Freiburg.

In this instructive treatise, Jansen reports twelve cases of thrombosis, in nine of which the sinus was operated upon, with five cases of recovery. In most of the cases the transverse sinus was

involved ; in one case there was purulent thrombosis of the superior petrosal sinus and simple thrombosis of the cavernous sinus ; in two cases, the bulb of the jugular vein was the seat of putrefactive degeneration. In some cases of affections of the transverse sinus, the neighboring venous channels were also involved, especially the jugular vein ; in one case, post-mortem examination showed thrombosis of the jugular, the transverse sinus, both inferior petrosal sinuses, both cavernous sinuses, and both ophthalmic veins. There was thrombosis of the jugular in eight out of the twelve cases. Limitation to the bulb of the jugular is apparently more common in cases of acute suppuration of the middle ear ; while in cholesteatoma, purulent inflammation of the transverse sinus seems to be more common.

If, therefore, in operating, the transverse sinus is found to be free, the symptoms must be referred to the bulb of the jugular vein and next to the small petrosal sinuses.

In these diseases, the greatest dangers arise from purulent arachnitis, and from metastases to the lungs. The former is more apt to occur if the thrombus of the transverse sinus spreads backwards to the torcular Herophili or in the direction of cavernous sinus. Pyæmic fever is often absent if the thrombus is limited to the transverse sinus and cut off from the jugular vein. If these conditions are not present, pyæmic fever is constant.

As regards the individual symptoms if the sinus thrombosis is located so as to be separated from the current of the blood, there may be no symptoms or only headache. The symptoms depend upon the relations of the thrombosed area to neighboring parts, and to distant effects. The latter include pyæmic fever, septicæmia accompanied by chills, metastases, and optic neuritis. The former are manifestations of meningitic irritation and symptoms due to extension of the thrombus into the jugular vein, the cavernous sinus, the mastoid emissary veins and torcular Herophili, or dependent upon peri-sinus abscesses (disturbances in the movements of the head).

Since, with the exception of the beginning of acute inflammations, most cases of suppuration in the mastoid and of extradural abscess run their course without fever, the occurrence of pyæmic fever is suspicious of sinus thrombosis, especially if it be accompanied by *repeated* chills. *Choked disc* is absent more frequently than it is present ; if present, however it is of great diagnostic value. It does not indicate especially a thrombus of the caver-

nous sinus (in the three cases of this sort it was absent), but points rather to a marked filling of the arachnoid space with fluid.

Symptoms like restlessness, vertigo, nausea, unsteadiness, delirium, and contractures do not necessarily point to purulent arachnitis; all these symptoms may be present in a case of simple inflammatory reaction of the pia to a collection of pus situated externally, or in a case of phlebitic or pachymeningitic inflammation. This must always be kept in mind in young persons.

If the thrombus involves the jugular vein, the diagnosis becomes easier (hard cord in the neck, swelling of glands, torticollis, tenderness, and dysphagia); the same may be said if it involves the cavernous sinus (swelling of the lids, followed by exophthalmos and finally orbital cellulitis, more rarely paralysis of the ocular muscles); or when it extends to the emissary vein of the mastoid (swelling, tenderness behind the mastoid process).

All the cases of thrombosis of the transverse sinus mentioned in the paper before us were accompanied by peri-sinus suppurations. Among 35 cases of sinus-thrombosis observed by Jansen during the past three years and a half, 31 were accompanied by such abscesses.

The general symptoms of peri-sinus abscesses are not characteristic: slowing of the pulse, vertigo, nausea, vomiting, constipation, and headache. Local symptoms are only of importance in localizing the affection: swelling of the bone, inflammatory infiltration of the soft parts behind the mastoid process or tenderness in this situation, impaired mobility of the head, torticollis. The diagnosis is rendered most certain, of course, when there is an agreement between the general and the local symptoms. If, in addition, pyæmic symptoms are added, there will no longer be any doubt as to the existence of thrombosis of the transverse sinus. Such abscesses occur more readily when there is sclerosis of the mastoid which interferes with extension towards the surface and facilitates a route towards the posterior cerebral fossa.

The earlier we operate upon a peri-sinus abscess, the more favorable the prognosis and the easier it will be to prevent or to discover a thrombus of the transverse sinus. Jansen does not attach much importance to respiratory or cardiac pulsation of the sinus nor to discoloration of its walls; in cases of doubt he punctures.

Jansen's statistics show plainly the favorable results of operative interference when indicated. Of 29 cases of sinus thrombus

without operation, 2 recovered ; of 16 cases in which the sinus was opened, 8 recovered.

Jansen ligated the jugular in three cases, but without favorable results. He believes that it is not necessary when the thrombus is limited to the transverse sinus. An abscess in this situation is separated from the venous channels toward the heart by a solid thrombus, and this should not be disturbed. He advocates, however, ligation of the jugular, when the bulb of the jugular vein, or the sinus just above this, or the jugular vein farther down is involved. He considers irrigation of the emptied portion of the venous channel unnecessary.

In operating, the bone is bared posteriorly, quite extensively, and the sinus is exposed ; this is done partly with the chisel and partly with Luer's forceps. The exposed portion must include the ascending branch up to the lowest horizontal portion. The adjacent dura is also exposed as far as it is diseased. If the thrombus be incised, this is done throughout the area occupied by the purulently degenerated thrombus and to a like extent ; the outer wall of the sinus is excised. Degenerated masses of thrombi are to be scraped from the walls of the vessel. Syringing is to be avoided. The bandage is renewed daily and the patient is kept in the recumbent posture. If the chills and high temperatures continue and sanious pus escapes from the region of the bulb, the jugular vein is ligated, preferably with ligation of the facial. The jugular is also incised up to the base of the cranium, so that no pus is allowed to remain in the veins and possibly extend into the cranial cavity by means of the inferior petrosal sinus.

To be properly appreciated, the histories of these twelve cases, including the symptoms, details of the operations, and subsequent course, must be studied from the original ; in fact, the entire work merits the most careful study.

Dr. OTTO KÖRNER : Die Ohrenheilkunde des Hippokrates. Vortrag, Gehalten in der Abtheilung für Ohrenheilkunde der 67. Versammlung Deutscher Naturforscher und Aerzte in Lübeck, 1895. (An address delivered by Dr. Otto Körner, of Rostock, at the 67th Meeting of German Naturalists and Physicians, Department of Otology, Lübeck, 1895.) J. F. Bergmann, Wiesbaden, 1895. Translation of the German review of Dr. G. ZIMMERMANN, of Dresden.

In the course of this interesting address, Körner demonstrates

by means of the Littré edition, how thoroughly Hippocrates understood and described the complex of symptoms occurring in aural diseases. The picture of disease accompanying, for instance, adenoid vegetations, otitis, and abscess of the brain, is presented in a masterly manner, even though the anatomical basis and the causal relations are by no means correct. Even to-day, it is worth while keeping in mind one of the lessons taught : never to lose sight of the connection which exists between the diseased ear and the body in general.

REPORT ON THE SECOND MEETING OF THE
AMERICAN LARYNGOLOGICAL, RHINO-
LOGICAL, AND OTOLOGICAL SOCIETY.

THIS society, founded a year ago, held its second annual, the first scientific, meeting in New York, April 17 and 18, 1896.

President, E. B. DENCH ; *Secretary*, R. C. MYLES, of New York.

Many valuable papers were presented, which elicited lively and instructive discussions. Of the rhino-otological papers we mention the following :

The Diagnostic Value of Ophthalmoscopic Examination in Cerebral Disease Depending upon Affection of the Ear. By THOMAS R. POOLEY, New York. The speaker emphasizes that optic neuritis never is present as long as the disease is limited to the ear ; it is rare in acute cases. It is noticed in otitic meningitis, sinus-thrombosis, and brain abscess. Its presence strongly supports the existence of severe intracranial complications of ear disease.

Otitis Media Suppurativa with Unusual Perforation in the Mastoid. By E. E. HOLT, Portland, Me. The perforation was into the digastric fossa. The president related another case of the same kind. The discussion dwelt on the dangers of forcible, and the advantages of judicious, syringing of the ear in purulent inflammation.

Deviation of the Nasal Septum ; Operation. Dr. W. C. PHILLIPS presented a boy on whom he had operated for almost complete occlusion of both nostrils. He had completely broken up the septum with an Adams forceps, and then inserted perforated cork-splints devised by J. B. Berens, which had given him great satisfaction, but were liable to produce ulceration when

used longer than from two to four weeks. The advantage of these splints is dwelt upon by C. W. Richardson of Washington, D. L. Hubbard and H. H. Curtis of New York.

Case of Actinomycosis Bovis. Dr. R. C. MYLES exhibited a patient, and said that in this and other cases he had effected a cure by extirpation of the growth.

Hysterical Affections of the Mastoid. Dr. J. E. SHEPARD, Brooklyn, related three cases. In these cases there are no definite objective symptoms; usually both ears are affected, and they are cured by drugs (bromides, etc.), suggestion, hypnotism, and operative procedures.

Diseases and Treatment of the Nasal Accessory Sinuses. Dr. R. C. MYLES exhibited photographs from transillumination. Antrum disease originated, with almost equal frequency, in affections of the nose as in affections of the teeth. The small trocar and irrigation tubes were invaluable for diagnosis. He explores through an opening between the first and second molars. In severe cases of frontal sinus disease he operates externally. In extreme cases of polypi the ethmoid is brittle, in suppuration almost of flinty hardness. He removes as much of the cells as he can. The sphenoid sinuses, 1'-1½" in depth, are not so difficult to open as is generally supposed. The discussion was chiefly about the uncertainty of transillumination. Dr. Myles said that in spite of its shortcomings it was a valuable aid to diagnosis. He stated that colored people had often no or only small frontal sinuses.

Acute Otitis Media as a Complication of Typhoid Fever. Dr. D. A. HENGST, of Pittsburgh, had, by a collective examination, ascertained that in 1228 cases of typhoid fever 28 had been complicated with otitis media.

A paper by Dr. T. C. CHRISTY, of Pittsburgh, on **Ulceration of the Nasal Septum** elicited a long discussion.

The Mastoid and Intracranial Complications of Middle-Ear Suppuration. Dr. E. B. DENCH describes the opening of the mastoid as it is now generally done, and detailed a case of acute otitic lepto-meningitis in which recovery followed an operation.

MISCELLANEOUS NOTES.

MEYER MEMORIAL.—The results, so far, of the appeal on behalf of the above object have been most encouraging. It is hoped that no efforts will be spared in obtaining further subscriptions.

The **AUSTRIAN OTOLOGICAL SOCIETY** will hold a special meeting in Vienna on June 28th and 29th.

The **ST. PAUL'S EYE AND EAR INFIRMARY**, Liverpool, has been in great part destroyed by fire. Happily no lives were lost, but a nurse sustained serious injuries by jumping from a window.

Mr. Councillor **EDWARD WHITE** has contributed £50 to the Brighton Throat and Ear Hospital.

APPOINTMENTS.

Dr. PASSOW, Assistant to Professor **TRAUTMANN'S** Otological Clinic in the University of Berlin, has been appointed Professor of Otology in the University of Heidelberg, to succeed the late Professor **MOOS**.

ARTHUR H. CHEATLE, F.R.C.S., has been appointed Surgeon to the Royal Ear Hospital, London.

F. J. DIXON, M.A., M.B., B.C. Cantab., **C. J. HEATH**, F.R.C.S., and **W. J. C. NOURSE**, F.R.C.S. Edin., have been appointed Assistant Registrars to the Central London Throat and Ear Hospital.

R. W. HERRICK, B.A. Dublin, M.D., has been re-appointed Honorary Surgeon to the Nottingham Throat, Ear, and Nose Hospital.

ST. GEORGE C. REID, M.R.C.S., has been appointed to take charge of the Bacteriological Department of the Central London Throat and Ear Hospital.

DONALD STEWART, M.D., Glasgow, has been re-appointed Honorary Consulting Surgeon to the Nottingham Throat, Ear, and Nose Hospital.

LOGAN CURRIER, M.D., C.M., has been appointed Physician to the Throat and Ear Dispensary, Edinburgh.

Dr. J. MELVILLE HARDIE, of Chicago, has taken charge of the Department of Otology, Rhinology, and Laryngology in the *Annals of Ophthalmology and Otology*, founded by Dr. JAMES PLEASANT PARKER, who died in St. Louis, Mo., February 6, 1896, in his forty-second year.

Contents of the newest number of the *Zeitsch. f. Ohrenhk.*

Vol. xxviii., No. 3, published April, 1896.

H. KNAPP. Further Observations on the Indications for Mastoid Operations in Acute Purulent Otitis Media and its Complications. (Appeared in our January number of 1896.)

O. RUDOLPH, of Munich. Eighteen Autopsies of the Hearing Organ in Measles.

W. KÜMMEL, of Breslau. Contribution to the Intracranial Complications of Ear Affections.

KONRAD REDOUER, of Dantzig. On Spontaneous Recovery of Cholesteatoma and Cholesteatomatous Affections in the Cavities of the Temporal Bone.

BOOK REVIEWS.

KUHNT. Inflammatory Diseases of the Frontal Sinuses.

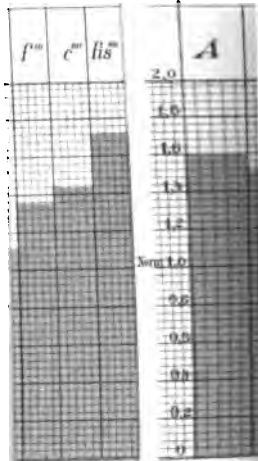
A. STEUER. Illustrations of the most Frequent Ear Diseases With a guide to the Examination of the Ear. Forty-three chromolithographs and 15 wood-cuts.

EDITORIAL NOTICE.

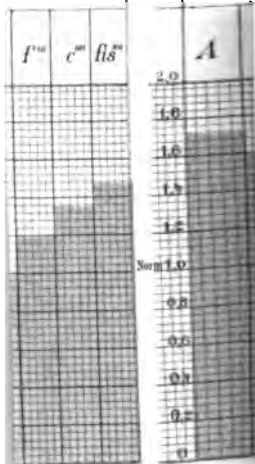
We beg contributors to send papers to be reviewed in the *Report on the Progress of Otology* to Dr. GORHAM BACON, 63 West 54th Street, New York; books and monographs in book-form, to the editors.

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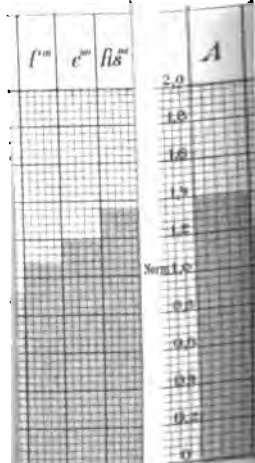
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ARCHIVES OF OTOLOGY.

A CASE OF ACUTE OTITIS MEDIA FOLLOWED BY AN ABSCESS IN THE TEMPORO-SPHENOIDAL LOBE; OPERATION; DEATH FROM SHOCK; AUTOPSY.

By GORHAM BACON, M.D.

(With two figures on accompanying plate.)

The patient, a young man of twenty-five years, single, born in the United States.

History: March 23, 1896.—Eight weeks ago, he had a slight discharge from the left ear, but before this he never had any ear disease. One month ago he came under the care of my assistant, Dr. F. Whiting, who found, on examination, that the seat of the trouble was in the attic, which was congested and bulging. This was incised and a few drops of pus evacuated. This operation was repeated on several occasions, and each time it gave great relief to the patient, who complained of considerable headache, especially over the left side. Besides the headache, there has been at times more or less tenderness on pressure over the mastoid. He was advised to enter the infirmary as an in-door patient, and receive proper treatment, but he refused to do so until to-day, when he was obliged to come in on account of the mastoid pain, which reappeared, and the severe headache. For the past three weeks his mother has noticed that he has had loss of memory for objects and names of friends. Memory for events good. He has been extremely irritable when suffering from headache, and his friends have noticed that he has acted and talked "queerly."

Examination.—There is very slight discharge in the left canal, but there is bulging of Shrapnell's membrane; small perforation. The patient has slight sensory aphasia. He is unable to name certain objects held before him, such as "scarf-pin," "cuff button," etc. No motor aphasia. He has severe headache,

especially on the left side. Temp. 98.8° F. ; pulse full and slow, 56 ; respirations 16. Heart shows long systolic murmur. For some time he has been inclined to constipation. He hears the watch held close to the ear and the bone-conduction is good.

Diagnosis.—Brain abscess suspected. It seemed best to Dr. M. Allen Starr, who kindly saw the case in consultation, to defer any exploratory operation on the brain for the present. I decided to operate at once on the mastoid and thoroughly clean out the contents of the antrum. Under ether an incision was made behind the auricle, and the antrum was opened. The bone was found very dense and like ivory. The antrum contained granulations and a small amount of pus, and was carefully examined with a probe to see if a sinus existed in the roof of the middle ear, but none was found. The bone of the antrum was roughened and was thoroughly scraped and packed with iodoform gauze, having first been washed out with a bichloride solution, and then a bandage applied.

March 24th.—The patient was free from pain during the night, and slept fairly well. Temp. normal, but pulse still slow, 56, and soft. Slight headache, and slight facial paralysis on the left side, undoubtedly due to the operation. He was seen in consultation to-day by Drs. Starr and Gruening. The latter examined the eyes and found the nerves and discs normal.

March 26th.—Temp. normal ; wound healing well. The patient has had very little pain.

March 29th.—Since the 26th the patient has improved steadily, and his memory for objects is perfect, but he still has difficulty in remembering proper names. He has been practically free from headache and is anxious to be up and get out of the hospital, and says he feels well. He denies any venereal trouble, but admits that he drank considerably for two years up to January 1st of this year. The patient is said to have gotten up out of bed to-day and to have exposed himself before the window, and to have used vulgar language.

April 1st.—His facial expression is weak ; he smiles constantly when talking ; there is slight tremor of his tongue and lips ; his mental condition is about the same except that he appears childish. This morning he was singing and laughing and trying to get out of bed, and was very much annoyed when made to return. His memory for proper names is especially poor.

April 4th.—To-day he complained of some general pain in his

head and had spells of hilarity, *i. e.*, laughing and singing. He vomited at noon and at 4 P.M.

April 5th.—The patient vomited twice during the night and complained of headache and nausea this morning. He vomited at 7.45 and again at 11.30 A.M. At 10 A.M. he was actively delirious, and later became somnolent and semi-comatose, brightening again at 4 P.M., when I saw him with Dr. F. Peterson in consultation, in the absence of Dr. Starr, who was out of town. He was able to recognize a silver quarter of a dollar but other objects he failed to name, simply answering "quarter" to everything held up before him. Reflexes normal; pupils normal and react; extra-ocular muscle movements normal. Very slight neuritis of both optic discs, affecting principally their nasal half. No appreciable swelling, but faint oedema of the retina in the macular region.

Diagnosis.—Abscess in the temporo-sphenoidal lobe. Immediate operation advised.

9.45 P.M. *Operation*—under ether.—Assisted by Drs. Gruening, J. L. Adams, and F. Whiting, I made a vertical incision in the scalp, beginning 2 cm upward and backward from the meatus, and carrying the incision upward 4 cm. I brought this incision forward and made a flap so as to give me space enough to remove easily a button of bone with a trephine. The centre pin of the trephine was placed 2.5 cm above the external auditory canal. The dura mater seemed normal but was tense. A large aspirating needle was introduced in different directions; viz., inwards, slightly forwards and backwards, but without result.

The opening in the skull was then enlarged in all directions. At this time the patient became very weak; pulse 170; respirations very slow and shallow. Hypodermics of strychnia, nitroglycerine, and aromatic spirits of ammonia were given, and the patient rallied. The aspirating needle was then introduced in a direction backwards, inwards, and upwards for 3 cm and brought out pus. After incising the dura, I introduced my little finger and found a fairly large abscess cavity, but there seemed to be no lining membrane. About half an ounce of pus was evacuated. The patient's pulse was noticed at this time to improve very much in character and strength. Iodoform gauze was carefully introduced in the abscess cavity and the external wound washed with boracic acid solution and the whole bandaged. The operation lasted one hour and a half.

Shortly after the patient was brought back to the ward, the

pulse became very rapid and weak, respirations at long intervals and shallow, and marked cyanosis appeared one and a half hours after the operation. Life was prolonged for about half an hour by hypodermic injections of tr. digitalis, atropia, and strychnia, and by artificial respiration.

The patient died, apparently from shock, about two hours after the operation.

From the time that the patient entered the hospital till the day of the operation, the temperature ranged from 97.8° F. to 99.6° F., with the following exceptions: On March 24th, at 9 P.M., it was 100.4° F.; on the day of the operation, at 3 P.M., the temperature was 100.6°, and also at 9 P.M., just before the operation.

The respirations varied from 14-20, and the pulse from 54-99.

Autopsy—eleven hours after death.—Rigor mortis and hypostatic lividity well marked.

Left kidney, marked congestion; a few drops of pus in the pelvis; no other evidence of active pyelitis.

Right kidney also contains pus.

Liver and spleen, normal.

Lungs show nothing of importance.

Pericardium, normal, but contains considerable clear straw-colored fluid; milk-spot on epicardium, near apex. Heart normal in size, soft; all cavities filled with fluid blood, dark red. Valves normal. Heart arrested in diastole.

Skull presents an irregularly circular opening, 3 cm in diameter, the centre situated directly above, and 3 cm from the external auditory meatus, on the left side. An opening also, 1 cm by $\frac{1}{2}$ cm, in mastoid bone, with its centre over the position of the antrum. On removing the skullcap, two openings were observed through the dura, the lower and larger one measuring 3 cm in vertical, 1.5 cm in horizontal diameter. It was filled with iodoform gauze. The other one, from which some brain substance protruded, was 5 mm in diameter. Vessels of pia engorged. The pia was found to be adherent to the dura mater at a point immediately below the opening made at the time of the operation, over an area of 2 cm in diameter. Near the centre of the adhesion the dura was thickened and perforated (Fig. A, 2); the outer third of the superior surface of the petrous portion of the temporal bone was discolored, its vascularity increased, and at a point corresponding to the perforation in the dura, the inner table presents an opening (Fig. A, 1) which communicates with the attic of the

tympanum immediately beneath. On removing the dura mater, an opening into the brain substance at the inner half of the third temporo-sphenoidal convolution, measuring 2 *cm* in diameter, is seen. The opening, which extends inward and a little backward to a distance of 3.5 *cm*, is filled with iodoform gauze. Fig. B, 2. A softened area of brain tissue, 3 *cm* in diameter, occupies the posterior half of the third temporo-sphenoidal convolution. Lying transversely in the softened brain tissue is a reddish mass, resembling a blood clot, which measures 3 *cm* in length and about 1 *cm* wide. On enlarging the opening made at the time of the operation, by an antero-posterior incision, the brain substance beneath the cortex throughout the whole of the lower part of the temporo-sphenoidal lobe is found softened and streaked with blood. The reddish mass above referred to as lying in the softened brain tissue proved to be the capsule of an abscess, the cavity of which measured 2.5 *cm* in its longest diameter and 2 *cm* in its shortest diameter. (See accompanying plate. Fig. B, 1.) The wall of the capsule measures about 2.5 *mm* in thickness. The capsule was empty, but exploration with a probe failed to discover any opening through which the contents had escaped. At one point, a blood clot apparently formed part of the wall. In all probability a rupture of the capsule had occurred, permitting the contents to escape into the surrounding tissue. The sinuses of the meninges and brain presented nothing abnormal.

REMARKS.

The case is an interesting one owing to the short time that the ear disease existed, and also on account of the seat of the disease. The inflammation in the ear was almost wholly limited to the attic and antrum. Each time that an incision was made in Shrapnell's membrane, a few drops of pus were evacuated, and this procedure always gave great relief to the patient. He was advised to enter the hospital for proper treatment, and told of the danger of delay, but he refused to come in until compelled to do so. In the light of the post-mortem examination, I regret that I did not cut away sufficient bone, when I exposed the antrum, to examine the roof of the tympanum from the middle cranial fossa. On account of the ivory-like hardness of the mastoid process and the history of the case, as well as the severe headache

complained of, the slow pulse and the aphasic symptoms, it seemed to me most likely at the time that the pus had forced its way through the tympanic roof. I failed, however, to find a carious opening in the antrum with a probe. It is probable that the small abscess situated just above the tympanic roof existed at the time the patient entered the Infirmary. If an operation had been done at this time, the result might have been different. Although no communication was found with a probe between the smaller and larger abscess cavities, an opening undoubtedly existed, as the smaller one was found empty at the autopsy, and the larger one had been successfully evacuated at the time of the operation.



FIG. A.—1. Carious opening in tympanic roof. **2.** Thickened dura turned back, but when in position covers carious opening.



FIG. B.—1. Primary abscess cavity connected with sinus in tympanic roof. **2.** Secondary abscess cavity in temporo-sphenoidal lobe. Both abscess cavities found free from pus at autopsy.

THE OPERATION OF MASTOID ANTROTOMY
FOR THE CURE OF OBSTINATE O. M. P. C.,
WITH DESCRIPTION AND PRESENTATION
OF THE AUTHOR'S ANTROTOME.¹

By H. A. ALDERTON, M.D., OF BROOKLYN, N. Y.

(*With three drawings.*)

PROLONGED chronic suppurative catarrh of the middle ear menaces the integrity of the human economy in several ways. Its tendency is always to attack new structures; it is never perfectly quiescent. It advances here a little, there a little. It first infiltrates, then absorbs. The former, at times, leads to necrosis of the soft and bony parts; the latter, to caries. This necrosis or caries opens up a path for the passage of inflammatory processes to new structures. From the middle ear these pathological paths lead, *e. g.*, to the internal ear; the facial nerve, the mastoid process, the lateral sinus, and the brain. Involvement of these structures produces deafness, facial paralysis, mastoiditis, sinus phlebitis, meningitis; cerebral or cerebellar abscess, etc.

The tympanic membrane, wholly or in part, may be the first to go, then the ossicles perhaps, and so on until the above-mentioned conditions manifest themselves. Or the ossicles may remain practically normal, the disease advancing in other quarters; thus the writer has removed both malleus and incus in a case of prolonged suppuration of the middle ear following scarlet fever and found them perfectly normal, and, notwithstanding the increased facility of drain-

¹ Read at the Annual Meeting of the American Medical Association at Atlanta, 1896.

age thus brought about, the process still went on. Or nature may throw off the ossicles, with the exception of the stapes, which is nearly always persistent, and the disease even cause the destruction and disappearance of the external attic wall so as to expose to view the aditus and the entrance to the antrum and still the discharge keeps up, more or less freely. And this in cases which are not truly cholesteatomatous, the surfaces in reach of vision and the probe being simply moist, succulent, and congested to a greater or lesser degree. This discharge may be so slight that the process seems to the patient to be quiescent or cured, but far from this being the fact, each observation, at longer or shorter intervals, shows fresh damage following farther advance. The general system may suffer by absorption through the constant passage of pus along an atrophied Eustachian tube; the hearing become progressively worse; facial paralysis make its appearance, etc.

Coincident with these changes the mastoid process is prone to become the seat of chronic otitis, with gradual condensation of the cellular structure and thickening of the external compact bony wall. If this change took place on all sides at once, it would be advantageous rather than otherwise, but such is not always the case, for often coincidently with the mastoid hyperostosis there occurs an erosion or thinning of the walls guarding more or less vital structures but little removed from the seat of active suppuration. How often do we see, in cases of prolonged suppuration with an acute exacerbation calling for operative interference to preserve the life of the patient, a sclerosed mastoid process that offers such an obstruction to the performance of antrotomy as often to prolong the time of operation to hours instead of minutes. And the increase of time necessarily occupied is not the only objectionable feature, for still more important are the repeated concussions to which the contents of the skull are subjected through the forcible chiselling required to make any headway. This violence may be the last straw required to change meningeal irritation into real meningitis or to rupture the thin wall of a brain abscess.

Now the writer, in his pathological researches upon specimens obtained from the dissecting room, has demonstrated to his own satisfaction that it is just in these cases that one often finds that the cause of the persistency of the pathological processes lies in the antrum (see Fig. 1). The mastoid process is sclerosed but otherwise healthy; the middle-ear cavity is then only secondarily instead of, as formerly, primarily involved, and it is in the antrum that one must seek for the active process.

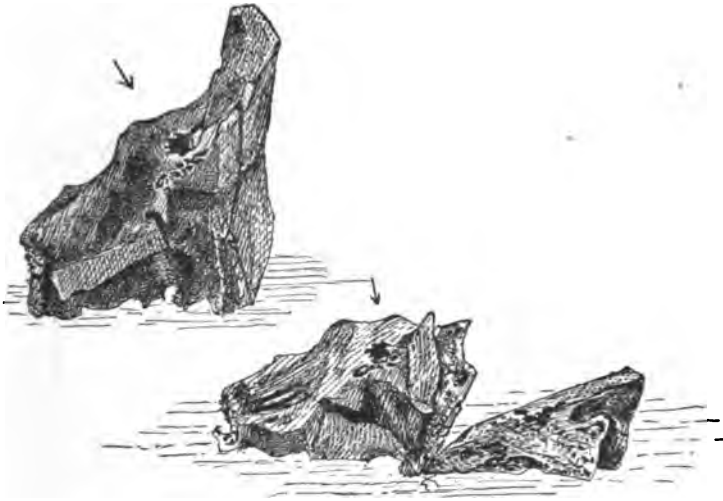


FIG. 1.—From specimen in the author's collection. Arrow points to opening made in roof of the mastoid antrum, the black nodules in the neighborhood being cells filled with granulations. The mastoid, except in this region, being sclerosed. The Mt., the malleus, and incus are gone, the stapes is bound down, and the aditus is free.

What do we find here—a lining of thickened infiltrated mucous membrane, with more or less granulation tissue, which has invaded the osseous walls of the cavity; the cells of the bone in the neighborhood of the antrum are filled with granulations, which, larger toward the antrum, become smaller as you approach the compact layer of the internal surface of the temporal bone. Looking down upon the cerebral surface of the tegmen antri one sees a sort of tessellated pavement, whose pinkish areas correspond to cells in the bone filled and gradually enlarged by granu-

lomata. It requires no imagination to foresee that the time must come when the contents of these cells will reach the surface and produce infection of the structures in contact. As shown by the above cut of a specimen in the writer's collection, this process may and does keep up, notwithstanding the fact that the ossicles (malleus and incus) have been thrown off, that the *Mt* is gone, and that the drainage from the antrum to the outer world is nearly as free as may be, except for the fact that the floor of the antrum is below the level of the lower wall of the aditus ad antrum.

What shall we do in cases of prolonged suppuration, where ossiculectomy does not bring about a cure, or where nature has removed the ossicles and still, after curetting the tym-

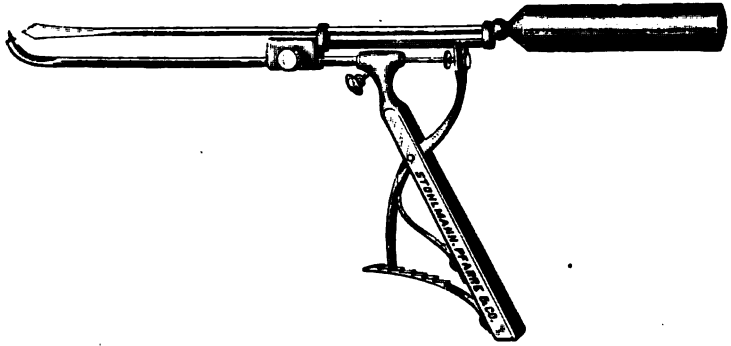


FIG. 2.

panic cavity and the mouth of the aditus and faithful treatment by syringing, etc., the discharge keeps up, with or without periodic exacerbations? Shall we perform the classical mastoid operation, subjecting our patient to the danger of cerebral concussion, of operative facial paralysis, or of accidental opening of the lateral sinus? Far be it from the writer to deprecate the running of all these chances where it may be necessary to extend the field of operative interference to the brain or its adnexa; where the mastoid operation is but the preliminary step to more radical measures. But where this is not contemplated, especially when all that is undertaken is the cure of the persistent suppuration, then the writer suggests that the instrument here presented may serve a useful purpose. (See Fig. 2.)

This instrument consists of a canula, to whose proximal end is affixed at an obtuse angle a handle and whose distal free end has such a curve that the mouth will, when this end of the canula is introduced behind the annulus tympanicus, be directed toward the tympanic mouth of the aditus ad antrum. Through this canula passes a probe-pointed stylet whose proximal end is manœuvred by a lever with fulcrum in the handle, the movement of the lever being regulated by a ratchet springing from the handle; this lever when pressed against the handle projects the watch-spring probe-pointed distal end of the stylet from the distal mouth of the canula through the aditus into the antrum. The distal end of the stylet is tempered in such fashion that it always continues the curve of the distal end of the canula.

To the proximal third of the canula, just behind the handle, is fixed a block, in which is a bore running parallel to that of the canula; within this bore on its proximal side is adjusted a rod fixable by a screw; this rod has at its proximal, and half an inch from its distal end, two similar eyes, attached above on its upper surface, through which passes another rod whose distal end forms a trephine and whose proximal end has the form of a handle with a shoulder, which permits the advancement of the trephine only up to within $\frac{1}{8}$ of an inch of the watch-spring distal end of the stylet, when protruded.

The trephine rod must always, therefore, remain parallel to its carrying rod and canula, and the trephine can never extend farther than to within $\frac{1}{8}$ of an inch of the distal watch-spring curve of the stylet.

The method of operating is as follows. The ossicles having been thrown off by nature or removed artificially and curettage of the tympanic cavity having been performed without resulting in the cure of the suppuration, the patient is anæsthetized. The external osseous wall of the attic is removed by means of Dench's bone punch and Hartmann's chisel forceps until a probe can be easily introduced into the aditus, all strands of fibrous tissue still remaining being curetted as far as may be into the

mouth of the aditus. If cocaine be used the hemorrhage is not obstructive in most cases.

Then a curved incision, $2\frac{1}{2}$ in. long, is made $\frac{1}{4}$ of an inch behind and parallel at all points to the auricle, and the bone exposed down to the beginning of the osseous canal by separating and reflecting forward the periosteum. The external auditory canal is now either packed with gauze or a tent is passed in sufficiently far and the whole posterior wall of the cartilaginous canal is cut through at a level with the edge of the osseous canal. The gauze or tent is now removed and the posterior wall of the canal approximated to the anterior, thus allowing the introduction of an aural speculum through the incision.

The carrying rod of the trephine rod is now disconnected from the block on the canula and, using the handle of the trephine as ordinarily, the trephine is bored into the outer table of the mastoid for a quarter of an inch or so, at a point $\frac{1}{8}$ — $\frac{1}{8}$ of an inch behind the middle of the posterior wall of the canal. This is in order that the trephine may bite when introduced afterwards. The trephine is now withdrawn and the canula introduced through the incision in the posterior wall of the canal, either with or without the use of a speculum, into the tympanic cavity and the mouth turned towards the aditus, the stylet pushed through the aditus into the antrum by the lever, and the lever caught on the ratchet.

The handle of the canula must now be held lightly by an assistant and the carrying rod of the trephine adjusted to the block on the canula. The operator then takes the handle of the trephine and, again introducing the trephine into the superficial hole previously made in the outer table of the mastoid, proceeds to bore into the bone until the shoulder stops farther progress, the handle of the canula being all the time held very delicately by an assistant, so as to produce no traction. The instrument is then withdrawn and the antrum is found to have been perforated (see Fig. 3).

The wound is now washed thoroughly through the artificial passage to the antrum and externally; the external auditory canal is packed with gauze introduced through the natural

orifice, thus bringing the posterior cartilaginous wall again into its normal position; the mastoid incision is sutured superiorly and inferiorly but left open in the middle, and the drainage tube of silver introduced through the trephined opening to the antrum. The silver drainage-tube has a shoulder which prevents it from disappearing into the bone, and the tube is sufficiently long to reach the antrum when the soft parts are in position. Gauze dressing is applied over the wound as in the ordinary operation.

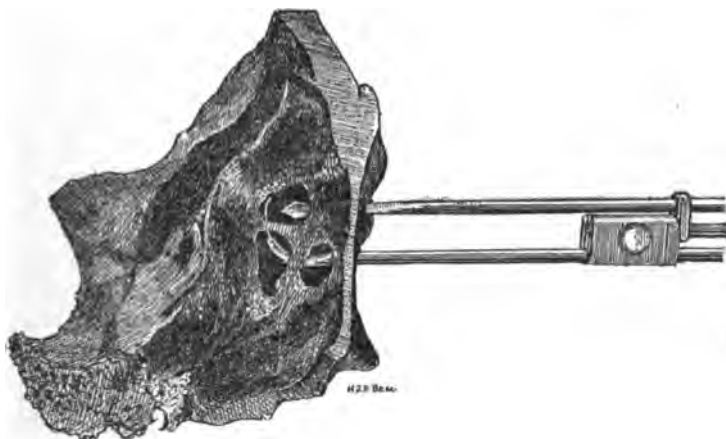


FIG. 3.—From specimen in the author's collection showing instrument in position. The roof of the ext. aud. canal, the tympanum, and mastoid antrum having been removed.

Cleansing and healing solutions can now be introduced directly into the antrum, as frequently as may be desired. The trephine hole is kept from filling with granulations by frequent removal of the tube, curetting, and re-introduction.

I have to thank Messrs Stohlmann, Pfarre, & Co., of 28th St., New York, for perfecting the instrument and furnishing cuts.

TWO CASES OF SARCOMA OF THE MIDDLE EAR.

By WILLIAM MILLIGAN, M.D.,

HON. SURGEON TO THE MANCHESTER EAR INSTITUTION; LECTURER UPON DISEASES OF THE EAR, THE OWEN'S COLLEGE.

(*With two figures.*)

MALIGNANT growths arising from any portion of the auditory apparatus are not frequently met with in practice. Such growths may be either epitheliomatous or sarcomatous in structure, the former usually occurring in patients of advancing years, the latter among children and adolescents. Of the two forms, sarcoma is the rarer. Sarcoma may attack the external or the internal ear, or it may involve the auditory apparatus by extension from some neighboring organ; *e. g.*, parotid gland, dura mater, etc. It may follow in the wake of long-continued suppuration, or it may, and usually does, according to Schwartze, attack a previously healthy ear.

The diagnosis of the affection can usually be made only by means of the microscope. Frequently middle-ear sarcoma appears in the form of a polypus which, after removal, returns rapidly, bleeds freely, and so rouses the suspicion of the surgeon that something more than a mere inflammatory growth is present. In the two following cases suppuration had lasted for years, attacks of spontaneous hemorrhage had been frequent, while the appearance of the growth—ashy gray and fleshy-looking—made it probable that it was malignant in nature. Confirmation of this suspicion was established by means of the microscope.

CASE 1.—S. M., female, aged sixty-three, was seen in consultation on account of the presence of a fleshy growth in the right external meatus. She stated that for many years she had had a discharge, but was unable to say exactly how long it had lasted or what the exact cause of the suppuration had been. For the preceding two or three years there had been frequent attacks of spontaneous hemorrhage, and during the time she had gradually lost weight and strength. Her previous general health had been good, and there was nothing of any special note in her family history. Upon examination the right external meatus was found blocked by a fleshy growth which, when touched by the probe, however gently, bled freely. Extensive caries of the surrounding bony parietes was present. The hearing power upon the affected side was nil, and the tuning-fork, placed upon the bridge of the nose, was heard best upon the same side. Facial paralysis of the right side of the face was present, and the various muscles supplied by the nerve had undergone secondary degeneration. The sense of taste upon the right side of the tongue was also completely absent. The patient complained of frequent and severe pain over the right temporo-sphenoidal and right occipital regions, although no pain was complained of upon percussion. The age of the patient, the appearance of the growth, the frequent attacks of spontaneous hemorrhage, and the statements made as to the slight progressive loss of weight made it probable that the growth was malignant in nature. A small portion of the growth was removed for microscopic examination. This was accomplished by means of a cold wire snare, and was immediately followed by a profuse hemorrhage—the blood pouring from the cut surface of the growth in a constant stream. The meatus was immediately packed with dry iodoform gauze, but the hemorrhage was not arrested till after free searing of the cut surface with a galvano-cautery point. Microscopic sections of the growth showed it to be an angiosarcoma of a very vascular type. (See Fig. 1.)

CASE 2.—E. B., female, aged eighteen, had suffered for seventeen years from suppuration of the left middle ear, brought on as the result of an attack of scarlet fever when aged one year. The right ear had been completely destroyed from the same cause, and the patient to all intents and purposes was a deaf-mute. Her general health had been good, and the family history presented nothing of a special nature. Her father and mother were alive and healthy, and her brothers and sisters also enjoyed perfect

general health. During the preceding six months the left external meatus had been observed to be blocked by some fleshy-looking substance, while frequent and severe pain had been complained of in and around the ear. In addition it was stated by the mother that the girl had lost weight, and had become very apathetic. When first seen, the following condition was noted: The left external meatus was blocked by a fleshy-looking vascular growth. Palpation with the probe revealed the presence of deep-seated caries. The tissues over the corresponding mastoid process and in front of the meatus were puffy and oedematous. The watch, when pressed against the left auricle, was just heard, and the tuning-fork, placed upon the bridge of the nose, was referred to the left ear. No facial paralysis was present. It was decided to attempt radical removal of the growth, and accordingly a few days subsequently the patient was placed under chloroform, and the auricle detached and lifted forwards on to the cheek. The external meatus was found completely blocked by a mass of growth which apparently sprang from the inner wall of the middle ear, and which spread forwards under the parotid gland and into the mastoid cells. As much of the growth was removed as was possible—the scraping out being continued until the internal carotid artery was exposed. Very free hemorrhage took place during the manipulation, but was controlled by tight packing with iodoform gauze. The patient recovered rapidly from the effects of the operation, but, as would be expected, recurrence took place within a very short time. Microscopic sections of the growth showed it to be a myxo-sarcoma of a fairly vascular type. (Fig. 2.)

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Fig. I

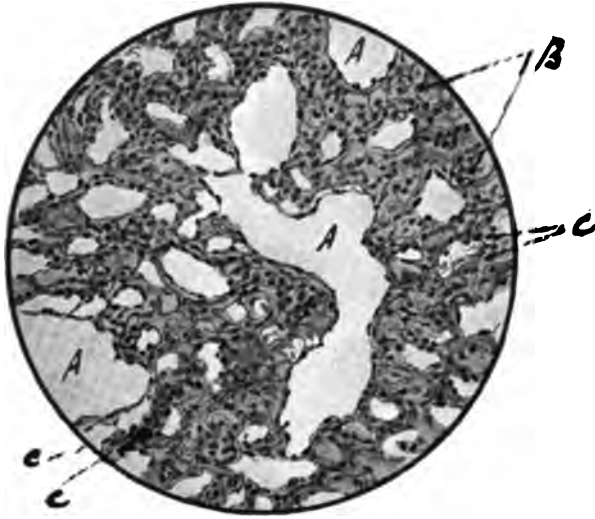


FIG. 1.

Description of Plate.

- A. A. Large blood-vascular spaces.
B. B. Trabeculae of fibrous tissue.
C. C. Groups of round cells (medium size).

Fig. II

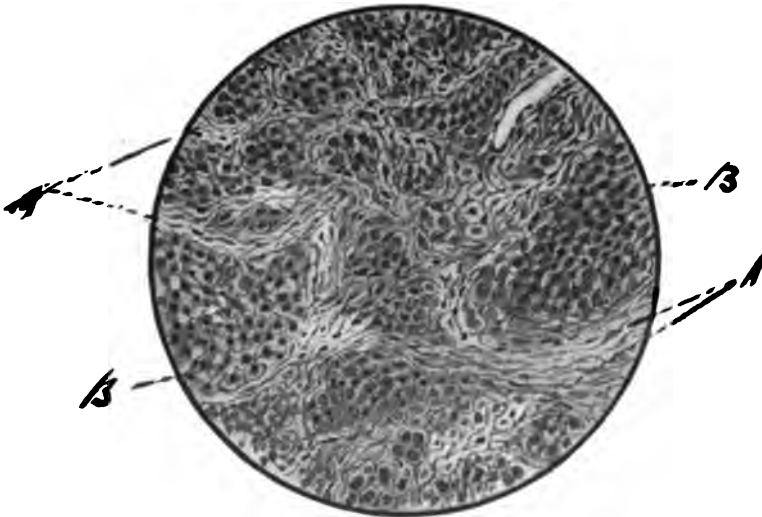


FIG. 2.

Description of Plate.

- A. A. Bundles of mucoid connective tissue.
B. B. Groups of cells showing a metamorphosis into large round (sarcomatous) cells.

A CASE OF TEMPORO-SPHENOIDAL ABSCESS
SECONDARY TO ACUTE LEFT-SIDED SUPPU-
RATIVE MIDDLE-EAR DISEASE; OPERATION;
ACUTE HERNIA CEREBRI; DEATH. •

By W. MILLIGAN, M.D.,

HON. SURGEON MANCHESTER INSTITUTION FOR DISEASES OF THE EAR; LECTURER UPON DISEASES
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INTRACRANIAL abscesses of otitic origin are in the vast majority of cases secondary to *chronic* suppurative middle-ear disease.

As comparatively few instances of intracranial abscesses secondary to *acute* otitis media have been put on record, the notes of the following case may be of interest.

F. M., male, aged forty-eight, had enjoyed good general health up to March, 1895, when he contracted a severe attack of influenza. He was laid up for a few weeks, after which he returned to his work—that of foreign correspondent to a large commercial firm—and remained on duty until September of the same year. About this time his left ear became suddenly painful, and a profuse purulent discharge made its appearance. He was troubled with constant pulsating tinnitus and with a marked degree of deafness. For three months he remained under the care of his ordinary medical attendant, during which time various forms of local treatment were tried. Pain in and around the ear and over the corresponding side of the head was so continuous and severe as to practically incapacitate him. When first seen upon Dec. 6, 1895, the following notes were made: "The patient complains of intense pain in the head, especially over the frontal region. This pain is aggravated by any movement of the head and especially by percussion. His mental condition is distinctly

apathetic and his cerebration is slow and sluggish. He exhibits in a marked degree the condition of sensory aphasia or word-deafness, while, in addition, motor aphasia is present, although to a less marked degree. There is extreme ptosis, and the left pupil is dilated. The left optic disc is swollen and its edges are fluffy. There is left facial paralysis, but no apparent paresis of arm or leg. The external meatus is partially occluded owing to prolapse of its postero-superior wall. The membrane, so far as can be seen, is congested and broken in its postero-superior segment by a small perforation. With the watch the hearing power upon the affected side is nil; upon the opposite side it appears to be normal. The tuning-fork placed upon the vertex is best heard in the affected ear. The temperature is 98.8° F., the pulse 66. During the preceding few days his wife says that there has been incontinence of urine and *fæces*. She also states that for a week he has had hardly any sleep on account of the severe pain in his head, which he constantly clutches between his hands and complains of." Immediate entrance to hospital was advised, but the patient was not brought for admission until two days subsequently. When admitted he was quite unconscious. Immediate operation was advised and was performed within a few hours. A disc of bone $\frac{3}{4}$ of an inch in diameter, with its centre $1\frac{1}{2}$ inches above and $1\frac{1}{2}$ inches behind the middle of the external auditory meatus, was removed with the trephine. The brain was found to be bulging and pulsation was absent. A small opening was now made into the dura mater and a pointed director was thrust into the substance of the temporo-sphenoidal lobe in a direction downwards and forwards. After penetrating the cerebral substance for about $\frac{3}{4}$ of an inch pus was seen to well up along the groove of the director. A pair of fine sinus forceps was immediately thrust into the abscess cavity along the groove of the director and the track in this way considerably dilated. In all about 4 drachms of perfectly odorless pus was evacuated. The abscess was at once irrigated with a 1-in-60 warm carbolic lotion. A soft rubber drainage-tube was inserted and the parts dressed in the ordinary way. The temperature, which at the time of operation had been 101° F., fell by 6 A.M. the next morning to 97.8° F., and the pulse from 108 to 82. During the first few days after the operation the patient made good progress, his temperature remaining, however, somewhat subnormal and his pulse varying from 90 to 100. Six days after the evacuation of the abscess it

was decided to open and drain the mastoid antrum. This had purposely been delayed owing to the critical condition the patient was in when first admitted. Upon opening the antrum no pus was found, but everywhere the mucous membrane lining the mastoid cells was intensely congested. The wound was accordingly at once closed and healed rapidly. From the middle of December to the end of January the patient made good progress and was able to move about the ward. About this time, however, a hernia cerebri began to make its appearance and increased with amazing rapidity. The patient's temperature rose to 103° F. and remained about this for some days. The wound was accordingly reopened and a director passed forwards and downwards in the direction of the previous abscess cavity, but no pus was found. The patient became rapidly worse and showed all the symptoms of advancing basal meningitis. Death took place upon February 8th, just two months after his admission to the hospital. At the post-mortem examination, which was made twelve hours after death, the abscess cavity was found empty and partially shrunken. Diffuse basal lepto-meningitis, evidently of recent origin, was found to exist. The dura covering the tegmen tympani appeared quite healthy. No erosion of the roof or parietes of the middle ear could be seen, and no suppuration existed within the mastoid cells. Apparently the pathogenic organisms had been carried direct from the middle ear to the interior of the temporo-sphenoidal lobe by way of the lymphatics or small venous radicles, no bone lesion intervening.

A NEW METHOD OF DEALING WITH THE EXTERNAL MEATUS IN OPERATIONS ON THE MASTOID.

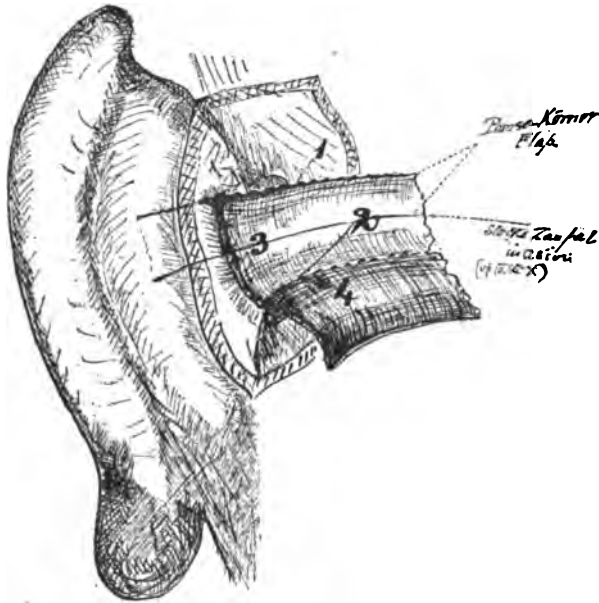
By RICHARD LAKE, F.R.C.S., ENG.

(*With one figure.*)

AS it almost needs an apology for offering a modification or new method of performing a plastic operation on the external meatus in operations on the mastoid antrum, I offer the following reasons for placing this before the profession. None of those now before us fulfils all requirements: (1) a good cosmetic result; (2) the best use of the tissues at our disposal; (3) absence of any tendency to contraction of the meatus afterwards.

Briefly to sketch out the evolution of our present operation from that time when Stacke conceived the idea of throwing the attic, antrum, and tympanum into one common cavity, instead of merely draining the antrum as if it were a bone abscess; Stacke at the same time removed the ossicles and any remnants of membrana tympani left, thus removing a fruitful source of recurrence of the mastoid disease. The next step towards an ideal operation was Zaufal's, by which he removed the *entire* superior-posterior wall of the bony meatus, and was consequently the first to touch the external cartilaginous meatus; this was divided by him along its posterior-medial aspect (see fig.). After Zaufal's came the operation as at present usually performed, and named after its two independent inventors, Panse-Körner. The two long and slightly curved lines in the figure show the incisions used for this method; this included portion of external mea-

tus was made to line the posterior and external part of the cavity, and was either held in place by plugging through the enlarged external meatus, or by stitches through it and the edge of the mastoid wound. Now there are several slight modifications of this operation at present used—thus Politzer stays his incisions short of the concha to preserve the form of the orifice of the meatus. Moll finds the flap unsatisfactory, and advocates its entire removal, etc.



- | | |
|-----------------------|------------------|
| 1. Superior Incision. | } In New Method. |
| 2. Inferior " | |
| 3. External " | |
| 4. Meatal Flap. | |

The operation I suggest in exchange, at all events fulfils the conditions required according to my original premise, and is carried out thus:

The external cartilaginous meatus is thrown forward in the same manner as in the Panse-Körner operation; a speculum is then pushed into it, though this is not necessary. The incisions 1, 2, 3 in the diagram are then made thus: No. 1, longitudinally along the superior mesial part of the canal.

No. 2, along the inferior mesial line, parallel to No. 1, and these two incisions passing through the cartilage of the meatus only, and being joined at their outer extremities by No. 3, just at the junction of the concha and meatus; the included cartilage is removed. Incisions through the *skin* of the meatus are now made along the lines Nos. 1 and 3, and a flap is thus formed as is shown by No. 4 in the diagram. The meatus is next replaced, and the post-auricular incision sewn up or not, according to the custom of the operator. The flap No. 4 will now be found to accommodate itself to the floor of the cavity, which it will do as the resilient cartilage is removed. The cavity is plugged, but there is no necessity or object to be gained by using any pressure. As far as I have used this method, I have been extremely gratified with the result.

THE "MASTOID" ANTRUM A PART OF THE MIDDLE EAR.

By ARTHUR H. CHEATLE, F.R.C.S.,

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(With three cuts in the text.)

THIS cavity is described as part of the mastoid process, although on examining its formation in foetal life it can clearly be seen that it is a definite and regular part of the middle ear, whereas the mastoid process does not even begin to make its appearance until the end of the first year, being a structure entirely apart from, but having a close anatomical relationship with, the antrum.

The foetal temporal bone can be easily separated into three parts—petro-mastoid, squamo-zygomatic, and tympanic ring; the petro-mastoid being divided into petrous and mastoid by an entirely arbitrary and imaginary line passing vertically through the bone close behind the stylo-mastoid foramen, the portion anterior and internal to this line being petrous, and that posterior and external being mastoid. According to this division the antrum is formed in the mastoid portion, but as the cavity is formed as part of the middle ear, it seems superfluous and absurd that an imaginary line should cut off a part of the tympanum, and necessitate its description along with a portion of bone which has nothing to do with the formation of the middle ear.

On looking at the petro-mastoid portion of a foetal temporal bone, say at six months, a recess is seen behind the incus, continuous with the inner tympanic wall, smooth and

slightly overhung by the posterior part of the tegmen tympani, which anteriorly forms part of the roof of the middle ear.

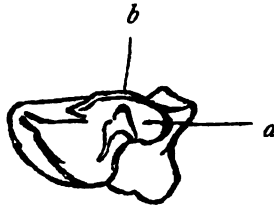


FIG. 1.—Petro-mastoid portion of temporal bone. Sixth month foetus. Left:

This recess is the inner wall of the antrum (*a*), and is converted into a cavity by the juxtaposition of the tegmen to the posterior part of the outer plate of the horizontal por-

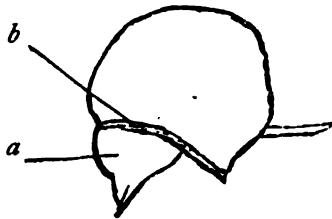


FIG. 2.—Squamo-zygomatic portion of temporal bone. *b*, Tegmen. Sixth month foetus. *a*, Part which forms outer wall of antrum. Left, looked at from inside.

tion of the squama (*b*); this outer antral wall, smooth at six months, becoming cellular at about eight months.

The rough sketches are taken from some of my own specimens, the method of formation of the antrum being constant in all.

At birth the antrum is large enough to hold a small pea, is lined with the same membrane as that lining the middle ear, having a smooth inner wall, a cellular outer wall, and a roof formed by the junction of the posterior part of the tegmen with the posterior part of the edge of the inner plate of the horizontal squama, Fig. 2 (*b*), the former overlapping

the latter forming the posterior part of the petro-squamous fissure, in which is lodged a process of dura mater; the cavity opening into the attic by a large triangular opening with the base uppermost. So that the antrum is fully formed during foetal life long before the mastoid process has begun to make its appearance from the mass of bone below and behind the antrum, the process being needed for the attachment of muscles, and becoming cellular later in life for the purpose of lightness. The function of the antrum is still a matter of conjecture. Evidently it must have some

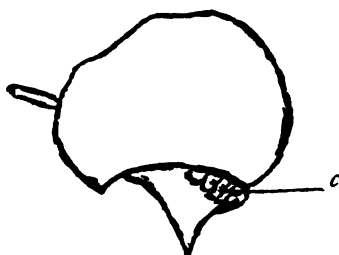


FIG. 3.—Squamo-zygomatic portion of temporal bone. Eighth month foetus.
Right : showing outer cellular antral wall *c*.

function in connection with the middle ear, or its presence would not be so constant as it is. Although not present all through the animal kingdom, the cavity is well marked and constant in monkeys. In fowls it is represented by the upper tympanic recess. In the crocodile these upper tympanic recesses meet above the occipital arch.

The points which I wish to urge are :

(1) That the antrum is a regular part of the middle ear, as seen by its formation, and as such is wrongly described as "*mastoid*" antrum; the name *tympanic antrum* would be more accurate, serving to disassociate it from the mastoid process and to define it as part of the middle ear.

(2) That as it is part of the middle ear, the imaginary division of the petro-mastoid into two parts is anomalous; and it would be better to describe the petro-mastoid as one bone.

ON THE PRESENT STATE OF THE VARIOUS TESTS FOR HEARING.¹

BY PROF. BEZOLD, OF MUNICH.

Abridged translation by Dr. J. A. SPALDING, Portland, Me.

ALTHOUGH practical needs have compelled the aurist again and again to seek for further means of testing the hearing, it would be looking at the subject from too narrow a point of view, were we to see in our determination of the amount of hearing nothing more than a perfection of the morbid picture, and a verification of the results obtained by treatment.

The function of the organ whose testing and care lie in our hands has attracted the attention of our most learned thinkers. But it has generally been given to the aurist to determine its average capacity, its limits for various tones, and, above all, for the human speech. Moreover, equally interesting as the function of the normal ear is that of the pathological, provided that we can decide what portions in the latter are to be eliminated owing to destruction and disease. The aurist is the only one in a position to collect observations, which, as a whole, give us an idea of both the function and the individual parts of the ear. Hence we should never forget that we are collecting material which can be more useful than to the aurist alone, and from that point of view we must carry out our tests.¹

As the ear possesses the capacity of differentiating every source of sound into its various elements (tones), we must assume a mechanical apparatus, which is found at the termi-

¹ A paper read before the German Otological Society, in May, 1896.

nation of the auditory nerve, and repeated observations localize the scale for tones in the membrana basilaris of the cochlea, just as Helmholtz originally described it.

Entire series of tones were of no use to us until we ceased to think of noises as different from impressions of sound. The separation of noises from tones long hindered the development of otology, because it gave rise to the idea of a separate region for the perception of noises outside the cochlea, in another portion of the labyrinth.

This is not the place to discuss all the papers on this topic, but I venture to refer to Barth's "The Theory of Tones and Noises,"¹ in which he demonstrated the probable composition of all sorts of noises from portions of the scale perceptible by the human ear. With Barth, as with Dennert,² we can say that "no proof has yet been offered to show that noises and sounds are different qualities of vibrations, nor that the cochlea cannot resolve them."

The theory of the perception of vibrations as an exclusive function of the cochlea received new support when Kreidl³ proved that goldfishes, which have no cochlea, were totally deaf. I too, in the human ear, have shown that no hearing exists after the exfoliation of the labyrinth. In some of my cases only part of the cochlea was exfoliated, but I do not lay stress on that, because I think that destruction of any part of the membranous portion is enough to destroy the function of the whole. I have also seen several cases of total deafness in *bilateral necrosis* of the labyrinth. Hence all of the tests made after destruction of this part of the ear show that the auditory nerve without its accessory apparatus reacts just as little to waves of sound, as the optic nerve without a retina to waves of light. One of the best and most rapid tests of hearing is the human speech, if particular attention is given to the consonants as ascertained by Wolff. He grouped his sounds into:

1. The deep, like R and V.
2. The middle, like the explosives B, K, T.

¹ *Zeitsch. f. Ohr.*, xvii., p. 81.

² *Archiv f. Ohr.*, xxix., p. 83.

³ *Pflueger's Archiv f. d. ges. Physiologie*, lxi., 450.

3. The high and strong, like S, SH, and G, and the high and weak, like F.

L, N, and H are excluded, as dependent on other tones [tone-borrowing].¹

Instead of the consonants, I employ the words of numbers as test words. The objection raised, that they can be more easily guessed than other words, does not prevent me from using them. For, all other words can sooner or later be guessed by frequent repetition. To test with words of which the patient has no idea, may lead us astray. To test with the words of numbers is indispensable in children, as investigations in the schools have shown.

Equal intensity of sound can be obtained by using the residual air left after forced expiration, though care should be used to speak always at the *same tempo*.

Experience having shown that in certain definite forms of disease the same words are defectively perceived, it is plain that tests with speech may serve as a sort of diagnosis. For instance, the low tones in the words "one hundred" are worst perceived in affections of the conducting apparatus. On the contrary, in acute simple, as well as in perforative and exudative, inflammations of the middle ear, I discovered a characteristic loss for "fifteen" and "three." The loss of the word "seven" is also unfavorable in a prognostic point of view.

Just as "fifth" is often lost in acute exudative processes, so "nine" or "nineteen" are not well heard in uncomplicated closure of the tubes.

The greatest auditory defects are found in diseases of the labyrinth, associated or not with affections of the middle ear. One word, "seven," is characteristically dulled, as well as others, generally heard at some distance. "Fifth" and "three" are ill perceived.

Familiarity with the details of the perception of the voice in various diseases of the ear is important in the *discovery of simulation*, of which we hear a good deal since the introduction of accident insurance.

To test speech thoroughly, being laborious and taking

¹ Compare these ARCHIVES, xix., p. 298.

much time, it is quite sufficient in most cases after testing a few words to note the distance for those perceived with the greatest difficulty, as suggested by Lucæ. For this reason I have of late abandoned the use of the watch, of the various audiometers, the telephone, and musical instruments.

The distance at which a whisper or low voice is heard is justly regarded as a most useful test of hearing.

So many methods of testing have been brought forward of late that a proper limitation of the most accurate has become one of the most difficult of tasks for the aurist, and we need not be surprised that the test for bone-conduction has been criticised as too complex for accurate results. With this view, however, I cannot agree, for even Weber's test, and still more Rinné's and Schwabach's, assure a differential diagnosis between similar forms of disease, not to be obtained in any other way. To abandon these tests would cause otology to retrograde many a decade, to say the least.

The idea so often expressed, that the test for B. C. in advanced years is useless, is not only unjustifiable in a physical point of view, for the bones do not change in age enough to account for loss of conduction of sound, but it can even be easily shown that objectively visible acute or chronic middle-ear diseases show prolonged B. C. in the aged as in the young.

My observations in this respect show¹ that B. C. does not *per se* diminish in old age, but the perception of it is reduced in proportion to the gradual impairment of the whole faculty of audition. In one hundred and thirty-four aged patients tested with *a'*, I found normal duration of B. C. in forty-five per cent. and increased in twelve per cent. Moreover, we must not forget that in this list there was not a single case of middle-ear inflammation, which even in the aged as in the young prolongs B. C., provided that the hearing had not previously been less reduced than in proportion to the age of the patient. The occasional shortening of B. C. in similar cases signifies the same pathological alterations in the middle-ear as at other periods of life.

¹ These ARCHIVES, xxiii., p. 214.

If we extend our B. C. tests to the higher forks, we meet with a source of error which increases with the pitch of the tone, because simultaneous *conduction through the air* is less to be excluded the higher we go in the scale.

So, too, owing to the concussion of lower forks, we may abandon them in testing the lower end of the scale, because simple concussion induces many errors, as I have shown in deaf-mutes.

The most satisfactory forks to use are the A and the *a'*, with occasional use of middle *a*.

My reasons for this belief are that the duration of B. C. is best tested with the large unclamped A, because it is heard from the skull long after its vibrations have become imperceptible to the feeling. In pure affections of the conducting apparatus, the prolongation of B. C. beyond the normal duration increases with the depth of the fork employed. Nevertheless, the test for *duration* with the higher fork is useful at times, because in the sclerotic forms of ear disease we find shortening or loss of this very tone by B. C., whilst the lower fork A is still heard prolonged.

Weber's test should always be made with one fork, *a'*, and, if possible, on the same spot on the skull. It is most decisive and accurate in acute exudative processes of the middle ear, and may be said at times to be an arbiter of life or death. For when in middle-ear suppurations the former perception of the fork in the diseased ear ceases, and it is no longer heard by A. C., this is an indication for opening the middle-ear cavities, because the symptoms indicate invasion of the labyrinth and danger to life.

In Rinné's test I employ the *a'* fork, which, after dying out on the mastoid, still vibrates for thirty seconds before a normal ear. Lucæ uses a *c* fork, but I prefer the *a'* because it lies in the centre of the scale of tones, and within the vocal region of the same. Higher forks than *a'* are not advisable, because we cannot exclude the chance that they may also be heard by aërial conduction.

The diagnosis of slight degrees of anchylosis of the stapes in pronounced unilateral sclerosis can be made by Rinné's test, showing shortened positive or negative result even in

the opposite ear, despite the fact that the hearing for speech on this same side is normal or nearly so.

In exudative processes and swollen conditions in the middle ear, on the contrary, Rinné is always positive though shortened, despite a relatively high degree of deafness for the voice. Hence we see that its result is dependent on other physical causes than in simple fixation of the ossicles, of which chronic suppuration and sclerosis form the prototypes.

When *one* ear is very deaf and the other about normal, we cannot make a diagnosis from a shortened positive or negative Rinné, whilst a decidedly positive result is valuable from this point of view. Schwabach's test may also be looked upon as reliable in these cases, provided that it shows decided prolongation of the bone-conduction.

I will here state that in the tests now under consideration, only those diseases are considered *which permit of a distinct diagnosis. Especially is it the chronic middle-ear suppurations and their residua, with large perforations in the Mt, in which we can assume well-marked fixation of the conducting apparatus owing to preponderance of the tens. tymp., to say nothing of all the other alterations in the case. And those it is that give us the purely functional picture of disturbance of conduction.* In such conditions Schwabach notes a negative Rinné, even when the deafness is slight. Brunner,¹ too, speaks of the constancy in the results of Rinné's and Schwabach's tests, together with defects in the *lower tone scale, but with preservation* of the upper, as a "lantern and guide along the oftentimes doubtful path of the functional tests for hearing."

So, too, in simple tubal affections which affect the conducting apparatus on one side only, Siebenmann has invariably obtained a functional picture of obstructed conduction.²

A clearer picture still can be found after traumatic rupture of the *Mt*, in which my investigations show³ all the

¹ These ARCHIVES, present volume.

² These ARCHIVES, xxii., p. 12.

³ "Traumatische Perforat. d. Trommelfels," these ARCHIVES, xxii.; and Spitter, "Traumatische Perforat. d. Trommel," *Inaug.-Dissert.*, Munich, 1895.

characteristics of fixation of the conducting apparatus. Rinne's test, in correspondence with the slightly diminished hearing for the voice, is positive but shortened. When the *Mt* is restored to its integrity, the symptoms are absent.

The few people with perfect hearing that can voluntarily contract their tens. tymp. are excellent subjects for deciding the influence of the isolated tensor. One medical friend possessed this faculty in such perfection that at every contraction of the muscle we could see the light spot vibrate.

The hearing of this gentleman, being normal, showed but two alterations during the voluntary tension: the lower-tone limit was brought from A to E, and the fork A was heard eighteen seconds longer by B. C.

If the whole conducting apparatus, except the stapes with its tendon and the lig. annul., is destroyed, the latter is tightened by the stapedius, and we find well-marked symptoms of fixation of the conducting apparatus. If now the same functional disturbances are met with in an intact *Mt* and an empty tympanum, as in sclerosis, we are justified in diagnosticating fixation at the more active portion of the conducting apparatus, namely—at the foot-plate of the stapes. In five cases, examined *post mortem*, I found calcification or partial ossification of the lig. annul.¹

The series of clamped tuning-forks which I now employ in testing the hearing extends from A to c'', divided between ten forks with about a fifth between. This gives greater uniformity in the intensity of the tone than by any former apparatus. From c'' to c''' I use organ pipes and a modified Galton's whistle, with a micrometer screw to change the width of the orifice, by means of which the sound can be heard at such a distance that the blowing is inaudible. The highest note produced by this whistle is 55,000 double vibrations a second.

The discovery of defects for A. C. in middle-ear diseases which disturb the equilibrium of the conducting apparatus, led me to search for a series of tones complete at the *lower end of the scale*. Or, as Lucæ says: "If the low tones are

¹ These ARCHIVES, xxiii., 48; xxiv., p. 67; and xxv., p. 127.

heard until they die out, we can exclude important alterations in the conducting apparatus."

Long ago it was observed by Wollaston,¹ and confirmed by J. Mueller,² that deafness artificially produced by tension of the *Mt* during forced inspiration with closure of the mouth and nose, is not the same for high and low tones, but only for the high.

Once in possession of a continuous tone-series, I have in all cases of disturbance of the balance of the conducting apparatus not only demonstrated increased duration of B. C., but shortened perception of A. C. at the lower end of the scale. Thus we find, according to the degree of deafness, a varying district in the *lower limit of tones entirely lost*, and by means of the continuous tone-series we can determine exactly from which tone downwards the defect exists.

The only exception is in acute exudative processes with secretion into the tympanum, as I have mentioned and given reasons for, in all of my papers on this topic.

Examination for the lower limit of tones is only absolutely sure, when we close the eyes and state the moment at which the fork approaches the ear. If so performed, it surpasses in accuracy the measurement of waves of sound by Rinne's test and by the duration of bone- and air-conduction in the audible part of the scale.

When the upper limit of tones does not sink after removal of the *Mt*, hammer, and anvil, we see that an intact chain of ossicles is not necessary for the conduction of the high tones. On the contrary, the stapes seems to play the chief role in such conditions. This conclusion is forced upon us by the fact that, after extraction of the stapes, the upper limit for Galton 1.7 sank to 2.3, whilst "Seven" and "Fifteen" were poorly perceived.

When the upper limit of tones is much reduced, we may incline to the idea that the beginning of the scala is implicated, and occasionally an autopsy gives us an opportunity to verify this view.³

¹ *Philosoph. Transact.*, 1820.

² *Physiologie*, ii., p. 437.

³ These ARCHIVES, xxv., Plate I., Fig. 1.

V. Troeltsch once suggested that many so-called cases of sclerosis would in time reveal themselves under anatomical investigation as cases of fixation of the stapes alone, and that this condition would be recognized as a special form of ear disease. Since then numerous investigations by Politzer have verified the suggestion, whilst my most recent statistical papers show¹ the unity as well as the functional and symptomatic picture of the disease.

I cannot now enter deeply into the complex functional symptoms of diseases beyond the middle ear. Before being able to diagnose inner-ear diseases, we had to know all of the symptoms characteristic of the pathological alterations in the conducting apparatus. Since these are physically produced, they must always be present, and I am quite sure that each identical symptom has been proven.

The loss of a district at the lower end of the scale of tones: The simultaneous elongation of B. C. for the lower tones; well-marked positive Rinné with relatively good hearing, and a negative Rinné with greatly reduced hearing (provided that the other ear is not quite normal); each of these tests by itself seems affirmative, provided that we can exclude deception on the part of the patient. And all that we test in these experiments is always the same. The directly antagonistic relation between A. C. and B. C., which shows itself all the more closely the lower we go in the scale of tones.

It seems to me, in the question of diseases of the inner ear, that too great stress has been laid on the exclusive loss of *high tones*, whilst rather we find abbreviation in the duration of the hearing, or total defects at every portion of the scale, whilst each defect proves a disease of the inner ear, if at the same time B. C. also is abbreviated or lost.

Great interest attaches itself in middle-ear disease to the *uniformity* with which the hearing of A. C. decreases at the lower end of the scale down to the spot for which it ceases entirely, as we see in Werhowsky's recent paper,² in which the purely mechanical effect of disturbances in the conducting apparatus is fully illustrated.

The examination of deaf-mutes has opened up to us

¹ These ARCHIVES, xxiv., 234.

² Present volume of these ARCHIVES, p. 152.

an unexpectedly rich field in the diseases of the inner ear, auditory nerve, and cerebral auditory centres. The defects discovered are to be regarded as sharply defined types of but little known diseases, and may serve as a basis for a series of functional disturbances of hearing.

Another question to discuss is, whether we can determine *deafness* by our present tests for hearing. Here we have to differentiate between deafness for speech (in which there may be hearing for tones), and absolute deafness for both voice and tone. When the voice is no longer heard, tones may still be audible. But so far as practical life is concerned, the total loss of perception of speech must be regarded as deafness which we can consider as a deafness relative to absolute deafness to all impressions of sound.

Examination of deaf-mutes with a continuous series of tones shows a small definite zone in the scale, the loss of which is followed by deafness for the voice.

Relative and absolute deafness are easily discovered when bilateral, but unilateral deafness is difficult to establish, especially, absolute deafness for a portion, at least, of the scale, because the aerial conduction of tones at the lower end of the scale is entirely different from that of tones at the upper limit. From the lowest forks upward, to *c'* the vibrations are so slight by the air that the other ear need not be closed at all. For the next octave up to *c''* the moistened finger into the meatus of the good ear suffices to exclude it from the tones. In other words, for the lower five octaves the continuous series of forks is enough to establish total unilateral deafness. But the higher we ascend beyond *c''* the more difficult it is to exclude the good ear. So that for the highest tones we shall have to rely on the average obtained in a long series of patients, the good ear being hermetically closed.

My examinations of several cases of unilateral deafness for aerial conduction in unilateral loss of the labyrinth has proved that that portion of the scale is lost, which, as experience has shown, cannot be heard by the occluded ear, namely, the entire lower half, at least, so high as to *c''*.

The results of my tests in two cases of total unilateral

operative removal of the labyrinth, with perfect hearing in the other ear, were as follows :

Mr. G., fifty-four; left cochlea removed, November 3, 1883. Test March 4, 1896.	Mr. D., fifty-three; part of left cochlea removed, January, 1895. Test September 30, 1895.
Right ear normal.	Right ear normal.
Whisper..... 6 M. Lower limit..... 16 vibrations. Upper limit... Galton, 0.9 (Normal Galton, 0.8.)	Whisper..... 6 M. Lower limit..... 16 vibrations. Upper limit... Galton, 0.9 at 4 cm. (Normal Galton, 0.8 at 4 cm.)
Left-ear test; cochlea removed.	Left-ear test; cochlea removed.
Forks from A ¹¹ to a' = 0. Fork a'' — 60 seconds : 0.17 f''' — 23 " : 0.3 c''' — 42 " : 0.4 f#''' — 14 " : 0.5 Upper limit for Galton's whistle, 1.1.	Forks A ¹¹ to a' = 0. Fork a'' :— 58 seconds — 0.19 f''' — 25 " — 0.24 c''' — 37 " — 0.47 f#''' — 12 " — 0.57 Upper limit for Galton's whistle, 1.2.

These figures give us an approximate idea of the tones of various pitch, which can pass across from an absolutely deaf ear, to the firmly occluded normal ear, and we here possess a reasonably safe method of fixing absolute deafness for the upper portion of the scale with a normal second ear.

REPORT ON THE PROGRESS OF OTOLOGY DURING THE FIRST QUARTER OF THE YEAR 1896.

BY DR. ARTHUR HARTMANN, BERLIN.

Translated by Dr. C. ZIMMERMANN, MILWAUKEE, WIS.

PATHOLOGY AND THERAPEUTICS.¹

MISCELLANEOUS.

1. STETTER, Dr. Prof. Seventh annual report of the Ear, Nose, Throat, and Mouth Dispensary, from Jan. 1, 1895, to Jan. 1, 1896. *Monatsschrift für Ohrenheilk.*, No. 3, 1896.

2. CORRADI. The patients treated in the oto-rhino-laryngiatric department of the hospital in Verona in 1894. *Archivio ital. di Otol.*, vol. iii., p. 154.

3. NEW YORK EYE AND EAR INFIRMARY. 75th Annual Report, 1895. Ear Department. Drs. Hickok, Bacon, Dench, and Adams.

4. MANHATTAN EYE AND EAR HOSPITAL. 26th Annual Report, 1895. Ear Department. Drs. Roosa, Hepburn, Emerson, Nichols, Pomeroy.

5. NEW YORK OPHTHALMIC AND AURAL INSTITUTE. 26th Annual Report, 1895. Ear and Nose Department. Drs. Knapp, Toeplitz, and Vulpius.

6. BROOKLYN EYE AND EAR HOSPITAL. 27th Annual Report, 1895. Ear Department. Drs. Matthewson, Prout, Shepard, and Alderton.

7. MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY (BOSTON). 70th Annual Report, 1895. Ear and Nose Department. Drs. Blake, Green, Spear.

¹ Anatomy and Physiology of this quarter will appear with the second quarter in the next number.

8. NEWARK CHARITABLE EYE AND EAR INFIRMARY. 16th Annual Report. Drs. C. J. Kipp, William Rankin, and others.

9. BALTIMORE PRESBYTERIAN EYE, EAR, AND THROAT CHARITY HOSPITAL. 18th Annual Report, 1895. Drs. J. J. Chisolm, H. Woods, H. Harlan, F. M. Chisolm, J. R. Winslow, C. W. Hartwig.

10. NEW YORK OPHTHALMIC HOSPITAL (HOMŒOPATHIC). 44th Annual Report, 1895. Ear Department. Drs. H. C. Houghton, C. E. Beebe, G. A. Shephard, J. D. Lewis, and others.

11. THE HARLEM (N. Y.) EYE, EAR, NOSE, AND THROAT INFIRMARY. 14th Annual Report, 1895. Dr. R. E. Swinburne.

12. PAPALLE. Statistical report on the free clinic for diseases of the larynx, ear, and nose of Dr. Lichtwitz. Bordeaux, 1896.

13. NEW AMSTERDAM EYE AND EAR HOSPITAL. 7th Annual Report, 1895. Ear Department. Drs. Pooley, Myles.

14. HOLINGER, J. Asepsis and antiseptics in otology. *Fourn. Amer. Med. Assoc.*, Jan. 18, 1896.

15. EWING, FAYETTE CLAY. The treatment of aural catarrh in the London Central Throat, Nose, and Ear Hospital. *Fourn. Amer. Med. Assoc.*, Feb. 29, 1896.

16. LAURENS, G. Anæsthesia by guaiacol oil in otology, laryngology, and rhinology. *Ann. des mal. de l'oreille, etc.*, Jan., 1896.

17. STOTHER, G. Oxygen gas in the treatment of ozæna and purulent middle-ear disease. *British Med. Jour.*, Feb. 1, 1896.

18. TEXIER, V. A new method of employing ethyl bromide in otology and rhinology. *Ann. des mal. de l'oreille, etc.*, March, 1896.

19. AGUANO, D. On paracosis Willisii. *Ann. des mal. de l'oreille, etc.*, Feb., 1896.

20. SCHWAGER, Dr., Kaiserslautern. A case of noises in the ear objectively perceptible. *Monatsschr. f. Ohrenheilk.*, No. 2, 1896.

21. GERONZI, Dr. Hemiplegia of the facial nerve, of otitic origin. *Archivio ital. di Otol.*, vol. iii., p. 328.

22. BEZOLD, Prof. Results of pathologico-anatomical examinations of the ear in measles. *Muench. med. Wochenschr.*, 1896, Nos. 10 and 11.

23. BARNICK, O. Clinical and pathologico-anatomical contributions to tuberculosis of the middle and external ears. *Arch. f. Ohrenheilk.*, vol. xl., p. 81.

24. FERRERI. Anchylosis of the maxillary joint from ear disease. *Archivio ital. di Otologia*, vol. iii., p. 14.

25. HABERMANN, Prof., Graz. The syphilitic affections of the hearing organ. Jena, Gustav Fischer, 1896.

26. URBANTSCHITSCH, Prof., Vienna. On the reflex actions of the hearing organ on the motor apparatus of the eye. *Wien. klin. Wochenschr.*, 1896, No. 6.

27. GRASSMANN, K. Cases of acute cocaine poisoning. *Muench. med. Wochenschr.*, 1896, No. 6.

28. TREITEL. On hearing exercises after the loss of hearing. *Arch. f. Ohrenheilk.*, vol. xl., p. 123.

29. LEHFELD, ADAL, Director. Hearing exercises in the school for deaf-mutes, according to the method of Prof. Urbantschitsch. Vienna, 1895. Author's own publication.

30. LIEBMANN, ALBERT. Novel therapeutics of stammering. *Deutsche med. Zeitung*, No. 36, 1896.

1. STETTER removes the adenoid vegetations in some cases with the finger. He uses a pointed galvanocautery burner in treating hypertrophies of the turbinated bodies, making a canal, parallel to the surface of the turbinated bone, *between* the latter and the thickened mucous membrane. This procedure is not new, but recommendable.

KILLIAN (Freiburg).

2. CORRADI's report contains a remarkable case of carcinoma of the auricle, a case of traumatic abscess of the nasal septum, and some cases of rare affections of the soft palate.

GRADENIGO.

3. New patients, 5352 ; operations 546 ; incision of membrana tympani, 200 ; excision of ossicles, 6 ; polypi, 60 ; opening of mastoid, 50 ; operation for cerebellar abscess, 1 ; operation for epidural abscess, 1 ; removal of adenoids, 48.

GORHAM BACON.

4. New patients, 3334 ; incision of membrana tympani, 40 ; excision of carious ossicles, 5 ; excision of malleus for chronic catarrhal otitis media, 1 ; polypi, 30 ; opening of mastoid cells, 18 ; opening of lateral sinus, 2.

G. BACON.

5. New patients, 2322 ; inmates, 27 ; operations, 438 ; incision of membrana tympani, 50 ; excision of carious ossicles, 4 ; polypi,

42 ; opening of mastoid, 19 ; removal of adenoids, 99 ; trephining, for cerebral abscess, 1. G. BACON.

6. New patients, 3162 ; operations, 188 ; incision of membrana tympani, 21 ; polypi, 14 ; excision of ossicles (carious), 19 ; excision of ossicles for chronic catarrh, 1 ; opening of mastoid, 23 ; trephining skull, 2. G. BACON.

7. New patients, 4946 ; inmates, 240. Incisions of the drum membrane, 279 ; mastoid operations, 77 ; adenoid operations, 91 ; removals of necrosed ossicles, 31 ; polypus operations, 126.

H. KNAPP.

8. Ear patients, 1256 ; nose patients, 453 ; operations, 181.

H. KNAPP.

9. Ear cases, 1943 ; nose and throat cases, 1494 ; ear operations, 161 ; nose and throat operations, 455.

H. KNAPP.

10. Ear diseases, 2395 ; operations, 69.

11. Ear diseases, 458 ; nose and throat, 473 ; operations, 148.

12. A short statistical report on 3595 patients, of whom 1516 had ear diseases, treated by Lichtwitz during the last five years. The middle ear was methodically irrigated through the tube. Operations were only performed when it was absolutely necessary in complicated affections of the middle ear (three times). Three illustrations demonstrate Lichtwitz's method of treatment of purulent affections of the sinuses.

ZIMMERMANN (Dresden).

13. New patients, 456 ; operations, 6 ; incision of membrana tympani, 2 ; polypi, 1 ; excision of ossicles, 1 ; Wilde's incision, 2.

GORHAM BACON.

14. The writer's conclusions are that :

(1) Every instrument should be so constructed that it can be easily cleaned and examined.

(2) Before every examination, the instruments (speculum, probe, catheter, middle-ear instruments) should be sufficiently boiled, and immediately after use they should be washed in cold water, so that the pus, mucus, and blood may not coagulate and dry on them.

GORHAM BACON.

15. In this hospital, nitrous oxide gas is generally administered in the case of removal of adenoids. The curette is usually employed, followed by thorough scraping with the finger. When faucial tonsils are enlarged, they are removed with a Mackenzie guillotine. When the tonsils are very large, a cold wire snare is employed instead of the guillotine. After the operation, the

patient is kept indoors until the bleeding surface is somewhat healed. In the acute stage of otitis media, leeches are applied over the mastoid and in front of the tragus—supplemented by warm, wet cloths to promote bleeding and dispel pain. Poultices and blisters are never used. Instillations of morphine, two grains to the ounce, or a ten per cent. solution of cocaine are dropped warm into the ear. The membrane is incised if a collection of fluid is apparent behind the drum. The ear is inflated by Politzer's method, and kept clear by syringing with a mild boracic acid solution. In chronic non-suppurative cases, a few drops of the following solution are put in the inhaler attached to a Politzer bag, and the vapor forced into the middle ear; \mathcal{R} Chloroformi, ætheri acet. \overline{aa} 3 ii; spir. vin. rectific. ad \mathfrak{z} i. Massage is employed in some cases by means of the Siegle pneumatic speculum.

GORHAM BACON.

16. Guaiacol oil, tried in a few cases, does not seem to show any advantage over cocaine.

ZIMMERMAN.

17. At a meeting of the British Laryngological, Rhinological, and Otological Society held on January 19th, STHOER related the beneficial action of oxygen gas in two cases of ozæna, and in one of a purulent middle-ear discharge which had resisted all treatment. After nine weeks' treatment only a little watery discharge remained, the gas having been applied for three hours daily at intervals.

18. From physiological experiments and clinical experience TEXIER recommends the following method practised by Lermoyez and Helme. Five grammes of perfectly fresh ethyl bromide in children up to eight years (5 to 10 grammes in children until fifteen years, never more) are poured on a flannel mask all at once. The latter is held on the face for not more than 40 seconds. The eyes are left free, if the conjunctival vessels become injected and the pupils dilated—but after 40 seconds, at the highest, the time for the operation has arrived. Muscular tonus and reflexes remain unaltered, consciousness is eliminated for 30 to 50 seconds only. Contra-indications are tuberculous or inflammatory affections of the lungs, diseases of the heart and kidneys.

ZIMMERMANN.

19. AGUANO discusses the various theories and reports his case, in which chronic otitis with diminished mobility of the *Mt* existed. This caused either a rigidity or interruption of the ossicular chain, or, perhaps, an alteration of the intrinsic muscles, which could only be influenced by an especially strong irritation.

20. A girl, aged fourteen years, who fell on the left side of her head, four years ago, perceived a snapping noise in her left ear ever since. It was arhythmic and could be heard objectively within 20 cm from the ear, 110 times per minute. The patient could suppress it voluntarily. It continued also during sleep. The soft palate, uvula and palatal pillars moved simultaneously. The noise apparently was caused by the walls of the tube being alternately separated and brought in apposition again by clonic spasm of the tensor tympani. SCHWAGER cites an analogous case of Kaufmann (*Monatsschr., f. Ohrenheilk.*, 1894, p. 141).

KILLIAN.

21. Detailed description of the relations of facial paralysis to otitis media. GERONZI reaches the conclusion that there are such relations in some cases, but not in all.

GRADENIGO.

22. Although BEZOLD's interesting investigations and results are chiefly contained in Schwartz's *Manual of Otolgy*, every aurist will read this article (read before the Munich Medical Society) with renewed interest, as it goes more into detail and brings some new points of view. To the investigations of Tobnitz and Bezold others of Habermann (7 cases) and Siebenmann (6 cases) are added, the results of which entirely correspond to the former. Bezold thinks that the diminished faculty of reaction during the acme of measles is the reason for the remarkably small reaction, which is found in measles, in spite of the constant presence of pyogenic organisms in the pus. This assumption would explain best the fact, that marked objective symptoms do not appear before the stage of desquamation. He saw a certain proof of this in a case of morbillar otitis with operative opening of the antrum for subperiosteal abscess, in which, with otherwise normal course, there was not any reaction on the denuded bone, i. e., no injection nor formation of granulations, even 18 days after the operation. In regard to the special pathogenesis, the simultaneous onset of otitis with the general affection and its extension over the whole middle ear observed from the start, in connection with the almost constant lack of changes in the cartilaginous portion of the tube in the first days, seem to be decidedly contrary to the general surmise of a propagation from the cavum. The pathologico-anatomical conditions rather suggest a direct analogy of the inflammation with the exanthema. Bezold further mentions, with regard to the former studies of v. Troeltsch, Kossel, Hartmann, Rasch, and Wendt that the pathologico-anatomical findings in measles are not isolated in their frequency from other ear

affections. Finally Bezold characterizes the conditions during life, which do not show a specific alteration of the *Mt* as compared with the other infectious diseases. He does not remember a case in his long practice, seen during or shortly after the disease, in which a perforation of the *Mt* had not healed.

ERHARD MÜELLER, Stuttgart.

23. I. CASE. Miliary tuberculosis of the left ear of hematogenous origin.

II.—Subacute miliary tuberculosis in bilateral purulent otitis media and co-existing tuberculosis of the intestines, solitary tubercle of the cerebellum.

III.—Extensive tuberculous destruction of the temporal bone, tuberculous meningitis—probably originating in the intestines.

IV.—At first tuberculosis of glands and bones, then probably of the temporal bone, and afterwards of the soft parts.

V.—Tubercles in the trunk of the auditory nerve of a child, who died from meningitis. BANWICK describes the clinical symptoms of aural tuberculosis: entirely or almost painless course, rapid decay, rapid diminution of hearing, rapid progress into the surrounding parts. Acute tuberculosis of the ear is found, when the organism is crowded with tubercle bacilli from the blood. The more frequent chronic tuberculosis reaches the ear through the tube from the regenerating organs or hematogenously when the bone or the soft parts are first affected.

E. BLOCH (Freiburg).

24. Clinical history of three cases of ankylosis of the maxillary joint after ear affections, and method of operating.

GRADENIGO.

25. According to various authors, 0.75 to 2.67 out of 100 ear patients are syphilitic. They show characteristic changes in the different tissues of the ear analogous to those seen otherwise in the body in syphilis. The affections of the various parts of the ear are discussed in detail. Primary affections of the external ear are rare. Of secondary and tertiary forms, maculous, papulous, pustulous, and gummous syphilides are seen. The periosteum and bone show circumscribed or diffuse affections. The lumen of the external meatus may become obliterated by hyperostosis or diffuse hyperplasia of the periosteum. Only a few cases of papulous exanthemata of *Mt* and formations of gummata on *Mt* are observed. Primary affections of the Eustachian tube have occurred by infection with the catheter. Secondary

and tertiary changes not infrequently are associated with specific diseases of the pharynx. They may produce stenosis and obliteration of the tube.

There are only a few publications of pathologico-anatomical investigations of syphilitic diseases of the tympanic cavity (Kirchner, Voltolini, Schwartz, Gruber, Moos, and Steinbruegge). Clinically acute catarrh, acute and chronic purulent otitis media with perforation, sclerosis of middle ear, are observed. Syphilis of the labyrinth may occur in the secondary or tertiary stage of lues, but in most cases simultaneously with the onset of the general disease. The tertiary syphilis of the labyrinth generally affects both ears. The frequency of hereditary syphilis of the ear is differently stated ($\frac{1}{4}$ to $\frac{1}{3}$ of all hereditary syphilitic children). Even in utero the ear may be affected. In the first years of life there are more diseases of the external and middle ear. In a later period, even in the twenty-eighth year, according to Habermann, tertiary affection and incurable deafness may supervene. Hereditary syphilis may also affect all parts of the ear; maculous, papulous, and pustulous syphilides, no gummata, in the external meatus, otitis media, and sclerosis. Lues hereditaria tarda may invade the labyrinth at the age of puberty.

HARTMANN.

26. URBANTSCHITSCH gives a review of the reflexes, transmitted from the ear to the motor apparatus of the eye, which have been hitherto described, and observed by himself. They are: nystagmus, strabismus, paralysis of the superior oblique muscle, and pupillary reflexes. The following case of Urbantschitsch's is remarkable: A woman developed slight divergent squint on the same side on which she had still purulent otitis media. The squint increased considerably from the moment when a polyp, springing from the inner wall of the tympanic cavity, was removed with the snare, and persisted.

POLLAK (Vienna).

27. GRASSMANN's case showed numerous attacks of dyspnoea of 2 to 20 minutes' duration, vertigo, precordial distress, colic, intense feeling of cold, especially clonic and tonic muscular spasms, and marked psychic excitement. Improvement after about five hours. It is interesting, that the patient did not experience any unpleasant effect from a piece of cotton soaked with a 20 per cent. solution of cocaine, which he had applied to a painful place of his gums for several days and on the same morning

But as soon as he had swallowed some of a 5 per cent. solution contained in the cotton (on the whole not more than 0.05 gramme), symptoms of intoxication set in after five minutes. It could not be ascertained whether this was chiefly due to a more favorable resorption from the alimentary canal, or to an accumulative action of cocaine, or to a special disposition of the patient at the time. MÜELLER.

28. TREITEL sees only a very limited value in the exercises devised by Urbantschitsch ; confesses, however, that he has not had much experience with them. BLOCH.

29. The author, director of the County Deaf-Mute Asylum in Wien-Doebling, where Urbantschitsch made most of his experiments, indorses very warmly the introduction of hearing exercises in deaf-mute institutions. Lehfeld thinks it to be the duty of the schools for the deaf and dumb to practise hearing exercises. Those pupils should be subjected to them in whom still a trace of hearing is left, but not too much hope ought to be placed in the recuperation of hearing. The views of teachers of the deaf and dumb opposed to the methodical exercises are discussed in detail. The method itself is that of Urbantschitsch. In order to hear their own voice Lehfeld recommends the hearing tube : the patient speaks into the funnel, while both ends of a hearing tube are conducted into the ears by a double tube. HARTMANN.

30. The new treatment of stammering by LIEBMANN consists in securing the vowels a predominance over the consonants in the utterance of the patient, as it exists in the normal way of speaking. At the first sitting Liebmann lets the patient speak in the regular tone of speech with long vowels and short, but sharply articulated, consonants. Liebmann considers all gymnastics of breathing, voice, and articulation superfluous. A natural language is surely gained after a much shorter time (four weeks). More than a hundred patients afflicted with stammering were thus successfully treated by Liebmann. HARTMANN.

INSTRUMENTS AND METHODS OF EXAMINATION AND TREATMENT.

31. CORRADI, Dr., Verona. A method to obtain sounds of tuning-forks of equal intensity with a new instrument. *Allg. Wien. med. Zeitung*, No. 1, 1896.

32. DE ROSSI. Operative surgery of the middle ear, and new instruments. *Archivio ital. di Otolog.*, vol. iii., p. 1.

33. BOYD, E. G. An improvement of Wright's snare. *Med. Rec.*, Jan. 4, 1896.

34. FERRERI. A new retro-nasal polypotome. *Archivio ital. di Otol.*, vol. iii., p. 170.

35. RÉTHI, Dr., Vienna. A new snare for hypertrophied anterior extremities of turbinated bodies. *Wien. klin. Rundschau*, No. 6, 1896.

36. ARMSTRONG, HERMAN L. A new syringe for treating epistaxis. *N. Y. Med. Journ.*, Nov. 16, 1895.

37. DAAE, HANS, Christiania. An apparatus for treating ozæna with massage. *Arch. f. Laryng.*, ii., 2.

38. HARTMANN, A., Berlin. Instruments for operating on the tonsils. *Deutsche Aerzte-Zeitung*, No. 3, 1896.

31. CORRADI's instrument consists of a kind of curved and two-pronged steel spring, fastened on a wooden handle at its highest point of convexity. In order to cause the tuning-fork to vibrate, the spring with its narrowest part is introduced between the prongs. By rapidly pulling the spring out of the tuning-fork the latter commences to oscillate, and the vibrations must be of equal intensity (?).
POLLAK.

32. DE ROSSI describes (1) a speculum with a biconvex lens; (2) a pair of forceps for extraction of the ossicles. GRADENIGO.

33. BOYD's modification consists in the addition of a barbed needle which is attached to the snare by two loops and extends over the end of the canula. The base of the needle is graduated. It is used for transfixion of posterior hypertrophies.

M. TOEPLITZ.

34. FERRERI recommends a pair of forceps according to Lange, which is introduced through the mouth, for the removal of polypi springing from the posterior extremity of the inferior turbinated body and pendent towards the soft palate.

GRADENIGO.

35. The purpose of the instrument is to prevent slipping of the snare. The extremity of the turbinated body can be removed by it at once, *i.e.*, by grasping, transfixing, and snaring off. It consists, like the common cold snare, of a handle and a tube for conducting the wire. A strong rod, which forms a spring, runs through handle and tube, terminating in a needle, and can be moved by means of a ring.
POLLAK.

36. The syringe devised by ARMSTRONG is supplied with an

adjustable shield and piston and a post-nasal tip. In epistaxis as well as in atrophic rhinitis the nose is to be syringed with it, using hot water, as hot as it can be borne by the patient.

M. TOEPLITZ.

37. An elastic probe, slightly bent, is adjusted to a small disc, which rotates rapidly by means of a cord, connected with a larger disc that is put into motion. The frame, bearing the disc is screwed on a table. The patient turns the disc. The operator moves the instrument proper over the nasal mucous membrane (or later on the patient himself). DAAE is very well satisfied with his results. The apparatus is cheaper than others (\$2.50).

ZARNIKO.

38. HARTMANN increased the size of his conchotome (formerly devised for removal of the anterior extremity of the middle turbinated body) for tonsillotomy, but reduced it in size for the turbinated bodies. He can remove the entire anterior end of the middle turbinated body with one cut of the instrument and, therefore, thinks it to be more practical than Gruenwald's modification. The conchotome may be used for tonsillotomy, if only a portion of the tonsil is swollen, or if the swelling is only moderate, or the focus of the inflammation limited to a few lacunæ. Slitting is sufficient for healing, if there are only moderate concretions in the lacunæ. He uses for this purpose a sharply pointed, crescent-shaped knife (the handle forms a right angle with the blade), which severs the tissue easier than a blunt hook or a blunt-pointed knife.

H.

EXTERNAL EAR.

39. PRITCHARD, URBAN. Hyperostosis of meatal wall necessitating operation. *King's College Hospital Reports*, 1896.

40. MCBRIDE, PETER. Removal of a foreign body from the tympanic cavity. *The Medical Chronicle*, Feb., 1896.

41. MILLIGAN, WM. Foreign bodies in the external auditory meatus. *The Medical Chronicle*, March, 1896.

42. ALLPORT, FRANK. Myringitis acuta, myringitis bullosa. *Four. Amer. Med. Assoc.*, Jan. 18, 1896.

43. BARCLAY, ROBERT. Foreign bodies in the ear. *Med. News*, Jan. 11, 1896.

39. PRITCHARD removed a hyperostosis which completely blocked the meatus. Operated on, in two stages: (1) A large

piece removed with chisel and hammer ; (2) remainder removed with Pritchard's trephine worked by means of a dental engine. Strict antiseptic precautions, rapid healing, excellent result, the meatus appearing normal.

40. MCBRIDE had to sever the auricle from the bone and to chisel away the posterior and superior wall of the external meatus to remove a bean from the tympanic cavity of a child aged five years.

CHEATLE.

41. In his papers MILLIGAN urges three maxims :

(1) Be sure that a foreign body exists ; (2) If present, make a careful attempt to remove by syringing ; (3) If instruments have to be employed be careful that measures be undertaken with the utmost gentleness under proper illumination. The whole subject is dealt with, and a case related in which much damage was done to the middle ear, including fracture of the handle of the malleus, owing to neglect of the above rules.

42. The case reported was that of a young lady, aged twenty, who had suffered from an acute nasal catarrh for two or three weeks. On November 11, 1895, she experienced in the evening a sudden and severe pain in the left ear, which continued with increasing severity until the morning of November 12th, when the case was first seen. The drum membrane at that time was obscured by three large bullæ—one at the upper anterior quadrant, extending down nearly to the extremity of the handle of the malleus ; another at the junction of the drumhead with the posterior meatal wall ; another, the third, at the inferior extremity of the malleus. The bullæ were punctured and contained serous fluid. The drumhead was intact, as shown by Politzer inflation. Five days later, the drumhead had resumed a normal appearance and the hearing was perfect. GORHAM BACON,

43. BARCLAY reports three cases, the first of which was that of a lady, who, while picking her left ear with a hairpin, broke it, and, while trying to remove it suddenly, one portion of the hairpin became imbedded in the soft tissues of the floor of the external auditory canal, and every attempt to remove it only served to make it penetrate the flesh more deeply. The hairpin was removed, and under one or two applications the wound healed.

The second case, a clerk, aged eighteen, while lying upon his left side, had some bird-shot pitched towards him by a friend who was seven feet away. He felt shot enter the ear and cause deafness. On turning over the shot fell out but the ear felt

stopped up. On examination, his right drumhead was found a trifle congested but otherwise normal.

The third case was that of a man, aged forty-six, who for two weeks had suffered from deafness on the left side, with an occasional tinnitus, but without earache. On examination of the left ear, the vibrating portion of the drumhead was thickened, opaque, lustreless, and somewhat retracted; the flaccid portion and entire periphery much congested. Just in front of the handle was a dark body, resembling a dried blood-clot, but thicker. It was removed with a foreign-body forceps and it was supposed to be a coal-cinder. The patient made a rapid recovery.

GORHAM BACON.

MIDDLE EAR.

44. SCHMALTZ, H. The relations of acute otitis media to the general organism. *Bresgen's Sammlung zwangloser Abh.*, etc., 1895, Hft. 3.

45. GALETTI. A few cases of purulent otitis media after posterior tamponade of the nose. *Archivio ital. di Otol.*, vol. iii., pp. 25, 171.

46. POLLAK, JOS., Vienna. Diagnosis and therapeutics of acute otitis media and consecutive mastoid ostitis. *Centralbl. f. d. ges. Therapie*, Hft. 1 and 2, 1896.

47. PES, O., and GRADENIGO, G. Staphylococci in acute and chronic otitis media, especially in regard to treatment. *Giornale della R. Acad. di Torino*, Nos. 7, 8, 1895.

48. BRUCK. Treatment of suppurations of the attic with a new canula. *Deutsche med. Wochenschr.*, No. 4, 1896.

49. LAKE, R. Excision of ossicles and membrane in chronic suppuration of the middle ear. *Med. Press*, Feb. 26, 1896.

50. WALKER, SECKER. A case of exfoliation of labyrinthine structures. *Lancet*, Jan. 4, 1896.

51. SHIELD, MARMADUKE. The treatment of severe mastoid disease by implantation of skin-flaps. *Lancet*, Feb. 8, 1896.

52. CONSTADT. Modification of the operative technique of opening the mastoid process. *Ann. des mal. de l'oreille*, Feb., 1896.

53. TOEPLITZ, M. A case of epidural abscess due to acute suppurative otitis. *Amer. Med.-Surg. Bull.*, Feb. 15, 1896.

54. PRITCHARD, URBAN. Subacute middle-ear suppuration with an extra-dural abscess in posterior fossa. Rotatory symptoms. *King's Coll. Hosp. Rep.*, 1896.

55. ZAUFAL, E., Prof., and PICK, A., Prof., Prag. Otitic abscess of the left temporal lobe. Optic aphasia. Trephining. Recovery. *Prager med. Wochenschr.*, Nos. 5, 6, 8, 9, 1896.

56. GRADENIGO, G. Otitic cerebral abscess. Trephining of skull. Evacuation of abscess. Recovery. *Archivio ital. di Otol.*, vol. iii., p. 354.

57. MURRAY, R. W. Temporo-sphenoidal abscess secondary to middle-ear suppuration." *Brit. Med. Journ.*, March 7, 1896.

58. MAJOR. Middle-ear suppuration with head symptoms. Exploration of brain with negative results. Recovery." *Lancet*, March 28, 1896.

59. CORRADI. Purulent meningitis and acute hydrocephalus after acute purulent otitis media. Suspected abscess of the brain. Trephining. Death. *Archiv. ital. di Otol.*, vol. iii., p. 44.

60. GREEN, J. ORNE. Exploration of the lateral sinus. *Boston Med. and Surg. Journ.*, Nov. 21, 1895.

61. GRADENIGO, Prof. On otitic thrombosis of sinus. *Archiv. ital. di Otol.*, vol. iii., p. 484.

62. LUCAS, A. Case of thrombosis of lateral sinus. *Birmingham Med. Rev.*, Jan., 1896.

63. GREEN, J. ORNE. Circumscribed periphlebitis of the jugular due to mastoiditis. *Trans. Amer. Otol. Soc.*, 1895.

64. PASSOW. A case of chronic purulent otitis media. Gliosarcoma of the corpora quadrigemina. Death in chloroform-narcosis. *Deutsche med. Wochenschr.*, No. 44, 1895.

44. SCHMALTZ thinks that taking cold, in the modern sense, is one of the chief causes of acute purulent otitis media in contradistinction to infection. The latter may occur from outside, *e. g.*, by indirect traumatism, by penetrating injuries of the *Mt* or diseases of the meatus. The most important access is through the tube, through which the germs may enter from the respiratory and the alimentary tracts. The vascular system plays an inferior part in recent inflammations; but an embolic or hemorrhagic inflammation may occur in diseases of the heart, pyæmia, or nephritis. It may be due to parotitis, leukæmia, diabetes. About one per cent. of rachitic children suffer from otitis media suppurativa. In leukæmia more frequently the hemorrhagic inflammation is

observed ; in diabetes, rapidly advancing destruction of the hearing organs. All infectious diseases have a tendency to affect the ear, very rarely lues and malaria.

45. GALETTI reports four cases of acute otitis media suppurativa after posterior plugging of the nose on account of profuse bleeding, and discusses the cause of infection of the middle ear and the methods how to avoid such complications.

GRADENIGO.

46. Written for non-specialists. POLLAK lays especial stress on early antiphlogosis (application of Leiter's coil on the mastoid process, of tincture of iodine, etc.). If this were done in time, the operation would have to be resorted to only in a small proportion of the cases. An operation is only indicated, if after eight days the inflammatory symptoms do not yield to antiphlogistic treatment, if the profuse otorrhœa and the evening exacerbations, of the fever continue, or symptoms of meningeal irritation or chills set in.

POLLAK.

47. PES and GRADENIGO made bacteriological investigations in regard to the recent assertion of Lermoyez and Helm, that the pyogenic staphylococci rendered the otitis media suppurativa chronic by secondary invasion of the middle ear from the external canal. They tried to prove, that the secondary infections in acute otitis media occur frequently through the tubes, and that the protracted course of acute otitis is not necessarily due to staphylococci, but to more complicated causes. Except general conditions (acute or chronic infections), the following causes may be assumed : 1, retention of pus ; 2, mastoid complications (especially, in the sense of Bezold, abnormal extension of the mastoid cells, but not necessarily dependent upon them) ; 3, chronic inflammations of the naso-pharynx and external meatus. Against the assumption of Lermoyez and Helm they did not find pyogenic staphylococci in the ordinary absorbent cotton, only a few saprophytic germs.

They concluded their article with statistics on the occlusive aseptic treatment of acute otitis media. Among 167 cases of acute otitis media there were 96 with spontaneous or artificial perforation, of which 71 healed without suppuration. The inflammation lasted, at an average, two weeks, ten to twenty-three days. The authors regret not to be able to compare their statistical results with those of others who employ syringing.

GRADENIGO.

48. BRUCK found in some cases the introduction of Hartmann's S-shaped canula into the attic too difficult for the treatment of chronic suppurations of the attic in perforations of Shrapnell's membrane. He constructed, instead, a thin metal canula with lateral openings at its anterior end, which may be attached to an ordinary Pravaz's syringe. The author considers this to be better (?). NOLTENIUS.

49. LAKE describes the method of removing the membrane and ossicles and insists on the subsequent thorough clearing out of the attic. The indications for the procedure being : when the discharge, under careful treatment, does not stop in six weeks to three months ; when great impairment of hearing exists with good bone-conduction after healing has taken place ; when a perforation is present in Shrapnell's membrane with definite evidence of caries ; perforation in posterior superior quadrant ; large perforation in inferior half of membrane or loss of the whole membrane ; perforation in Shrapnell's membrane with caries of anterior attic wall ; and when evidence of caries of the inner tympanic wall is present.

50. At a meeting of the Leeds and West Riding Medico-Chirurgical Society, WALKER showed a sequestrum which he had removed, consisting of the semicircular canals, the vestibule, and the greater part of the cochlea.

51. SHIELD claims to have obtained good results in the treatment of mastoid disease when the removal of a large amount of bone was necessary, by turning in a tongue-shaped flap of skin dissected off from behind the ear, the base of the flap being above, on a level with the upper attachment of the auricle, the tip corresponding with that of the mastoid process.

52. A curved spatula, 9 mm wide, with a prominence on its lower end, is pushed under the periosteum in the centre of the posterior wall of the meatus and pulled forward. The width of the spatula shows the limits of the field of operation.

ZIMMERMANN.

53. At a meeting of the Section of Ophthalmology and Otology of the N. Y. Academy of Medicine, held January 20, 1896, TOEPLITZ reported a case of epidural abscess, in which the aural affection began early in October, 1895, with pain in the right mastoid. Four weeks later there was a scanty discharge, and it was still present when examined two weeks subsequently by Toeplitz. There was at this time only pain on pressure over the

mastoid ; bulging of the upper and posterior wall of the external auditory canal ; temperature normal. A free incision was made in the bulging portion and some granulations of the external meatus were removed. Four days later œdema over the mastoid developed, accompanied by extreme pain. The mastoid was immediately opened. The antrum was found free from pus. An opening was then chiselled backwards and inwards and a fistula found in the inner plate of the mastoid, which passed into a cavity from which about an ounce of thick pus was evacuated. The dura was exposed and found normal. The opening closed in five weeks and the hearing became normal.

GORHAM BACON.

54. A man, aged fifty-one, came to Pritchard's clinic complaining of discharge from the left ear, with giddiness and vomiting. The giddiness could be produced by turning the head sharply to the left and in no other movement ; during the giddiness objects seemed to pass in front from right to left and patient tended to fall towards the left. An abscess formed behind the ear. An opening found in back part of mastoid leading to ragged-looking dura mater in the posterior fossa. Complete healing in a month. The temperature never rose above normal, except for three days before the operation, when it only reached 99° F.

55. The case is especially interesting on account of the precise diagnosis of abscess of the brain and its localization made before the operation. Abscess in the white substance of left temporal lobe in its inferior and posterior portions. The diagnosis rested chiefly on the optic aphasia, which pointed directly to a lesion of the path of association from the occipital lobe to the centres of speech. The disturbance of speech, which the patient exhibited, appeared as slight paraphasia and was attributed to a lesion of the temporal lobe, since paraphasia occurs mostly in lesions of the latter or the insula, which could be excluded. The wanting of motor aphasia argued against the seat of the lesion in the most anterior territory of the path under consideration. The conclusion, that the lesion was situated in the temporal lobe itself and not behind it, was corroborated by the lack of all symptoms characterizing damages of the gyrus angularis sinister and of the occipital lobe. There was not a trace of hemianopia, which showed that the abscess must have been situated more forward. The paraphasia was so slight that it spoke for a slight or for no affection of the cortex of the temporal lobe. The other symp-

toms, chiefly the right-sided hemiplegia, agreed with the precise diagnosis of the seat as secondary affections. The operation, performed by ZAUFAL confirmed the diagnosis. The patient was dismissed as cured six weeks after the operation. POLLAK.

56. A peasant, aged forty-nine, had otitis media of the left ear from childhood. One day the habitual discharge of pus ceased and slight pain in the centre of the left side of head set in. After thirty days an apoplectiform seizure deprived the patient of consciousness for several hours. When the patient awoke he had lost his speech. When admitted to the clinic he had a slow (60), regular pulse, stiffness and pain in the muscles of the neck, paresis of left facial nerve, offensive pus in meatus, no alterations of the soft parts of the mastoid process. Temperature at night 39.3° C., pulse 60. The squama of the left temporal bone was trephined directly above the superior wall of the meatus, and the opening in the bone dilated in all directions with Luer's forceps. Dura mater of normal appearance, not pulsating. A large portion of the upper wall of the meatus is removed for the examination of the region above the tegmen tympani, but with negative result. About 1 cm above the superior wall of the meatus a canula (3 mm thick) is introduced to a depth of 3 cm, and serous sanguinolent offensive fluid aspirated. Cruciform incision as far as 3 cm, profuse oozing of offensive pus, evacuation of abscess cavity, drainage, occlusive dressing. The abscess was about the size of a pigeon's egg. Complete recovery after about one and a half months. GRADENIGO.

57. At a meeting of the Liverpool Medical Institution, held on February 27th, MURRAY related the case of a girl aged seven years who had a temporo-sphenoidal abscess on the left side, containing one ounce of pus, evacuated; one month later, convulsions suddenly came on, involving the right arm and leg and right side of face, with loss of consciousness; the lobe was again explored and a drachm of pus let out; in spite of this, death occurred, and at the post-mortem examination the left temporo-sphenoidal lobe was found inflamed and softened with pus in the lateral and fourth ventricles.

58. At a meeting of the Bradford Medico-Chirurgical Society, held on March 7th, MAJOR related the case of a man aged twenty-three years who had suffered with left middle-ear suppuration for many years. Two days before admission to the hospital severe headache and giddiness came on with Jacksonian convulsions

affecting the right arm, leg, and side of face. Appleyard trephined over the temporo-sphenoidal region and explored the left hemisphere with a needle, with a negative result. The man made an excellent recovery.

59. In a girl, aged seven, with chronic otorrhœa, suddenly severe meningitic symptoms set in. The following day, after opening of the mastoid process and the attic, the cranial cavity was opened from the mastoid process. A suspected abscess of the temporal lobe was not found. The post-mortem showed purulent lepto-meningitis with hydrocephalus.

GRADENIGO.

60. GREEN reports three cases. In two of them, a chronic suppurative tympanum was running its course without attention, and without marked temperature or any cerebral symptoms, when suddenly there was a chill and temperature at 105° F. In the third, a chronic tympanic suppuration was followed by sudden and persistent dizziness and vomiting, with a moderate rise in temperature. In all three, examination showed such a sensitiveness of the mastoid to pressure as to justify the diagnosis of mastoiditis, and a mastoid operation was advised and immediately undertaken. During the operation the lateral sinus was exposed, aspirated, and proven healthy, without any injurious effect, and phlebitis of the sinus was excluded. The subsequent history of all was that of a mild septic fever, which improved steadily from the time of the operation, and was over in from one to two weeks; in fact, the not unusual history of osteo-phlebitis in which, if the pus focus is removed early by operation, thus preventing further septic infection, the prognosis in most cases is good. The fever had already begun before the operation, and in all probability was not connected with that procedure.

GORHAM BACON.

61. GRADENIGO reports three cases of otitic thrombosis of the sinus. 1st case: Acute mastoiditis, aseptic thrombosis of left sinus transversus. Deeply seated abscess of neck. Death from lepto-meningitis and cerebellar abscess with latent course. The pain set in immediately after the opening of the mastoid process. No fever at all except the thrombosis of sinus. No symptoms pointing to an intracranial disease found at the operation. The cerebellar abscess was situated very deeply in the neighborhood of the medulla oblongata, and had at the examination nearly escaped detection. 2d case: Chronic otitis media of right

ear, septic thrombosis of sinus transversus, extra-dural abscess at the region of the tegmen tympani. Infarctions and pus foci in the lungs. Death. At the time of admission to the clinic serious complications in the lungs existed. 3d case: Acute otitis media of right ear with affection of mastoid process and subperiosteal abscess. Opening with chisel. Serious pyæmic symptoms set in. Opening and evacuation of sinus. Recovery.

GRADENIGO.

62. In LUCAS's case which ended fatally from pyæmia, pus was found at the post-mortem behind the *left* orbit, the infective process having extended from the *right* lateral sinus to the ophthalmic vein through the petrosal and cavernous sinuses.

63. GREEN reports the case of a man, aged twenty-eight, seen first July 1, 1891, with a history of typhoid fever five weeks before. At the very beginning of the so-called typhoid, according to his account, there was pain and swelling behind the right ear, which gradually extended down the neck just in front of the sterno-cleido-mastoid muscle. Ten days before entrance there was a slight chill and a few days after this a severe rigor. An examination showed the ordinary symptoms of otitis media and of mastoid disease, and great tenderness along the anterior edge of the sterno-cleido-mastoid muscle, but no indurated cord could be felt. The mastoid process was opened, which brought some relief for a few days. Later the patient had one rigor and fever and vomited. The neck was examined and, on opening the sheath of the internal jugular vein, a few drops of pus were evacuated. No thrombus. From this time convalescence was rapid and uninterrupted.

BACON.

64. The contents of this article are fairly described by the title. PASSOW says, with perfect right, that the diagnosis of brain tumor would have been easier if there had been no chronic otitis media (and mastoiditis). The bilateral papillitis ascertained before the operation apparently was not given due importance. The anæsthetic was carefully administered. Apparently death was caused by the sudden change of intracranial pressure, leading to paralysis of the respiratory centre, while the heart continued to beat for more than an hour longer. All rescuscitative efforts were in vain. On account of some interesting details the original is referred to.

NOLTENIUS.

INTERNAL EAR.

65. TRIFILETTI. Hysterical aphonia and deafness. *Archivio ital. di Otol.*, vol. iii., p. 320.

66. PRITCHARD, URBAN. Reflex labyrinthine symptoms during pregnancy. *King's Col. Hosp. Rep.*, 1896.

67. JOFFROY. Unilateral hallucinations. *Archives de Neurol.*, vol. i., No. 2, 1896.

65. Besides other hysterical symptoms, hysteric aphonia and deafness occurred in a girl, aged eighteen, after an excitement.

GRADENIGO.

66. A woman, aged twenty-nine years, four months pregnant, attended PRITCHARD's clinic, complaining of giddiness, vomiting, and vertigo, attacks followed by transient deafness. Same during a previous pregnancy, ceasing on delivery.

CHEATLE.

67. A man, aged sixty-five, had chronic aural catarrh of both ears with stenosis of Eustachian tubes, peripheric affection of the auditory nerves, especially the left. Abusus spirit. Hallucinations only occur in ear affections, if a hereditary or acquired disposition exists. Alcoholism is of special importance. The post-mortem revealed in the ear the changes diagnosed during life; in the brain, those generally found in alcoholism with dementia: in the right frontal lobe, the first and second temporal gyrus, and in the left first temporal gyrus.

BLOCH.

NASO-PHARYNX.

68. THOMSON, ST. CLAIR, and HEWLETT, R. T. The fate of micro-organisms in inspired air. *Lancet*, Jan. 11, 1896.

69. SEQUEIRA, J. H. Chronic pharyngeal affections and their relation to diphtheria. *Brit. Med. Journ.*, Jan. 20, 1896.

70. ST. CLAIR, THOMSON. On antiseptics and intranasal medications. *Ann. des mal. de l'oreille*, January, 1896.

71. BULKLEY, L. DUNCAN. Bicarbonate of soda in the treatment of a common cold. *Med. Rec.*, Jan. 18, 1896.

72. BOSWORTH, F. H. The recent progress of treatment in affections of the upper respiratory tract. N. Y. Academy of Medicine, Feb. 20, 1896. Nose and accessory sinuses. *Med. Rec.*, Feb. 29, 1896.

73. SEILER, CARL. A novel method of performing major operations within the nasal cavities. Meet. Phila. Co. Med. Soc. *N. Y. Med. Fourn.*, Nov. 16, 1895.

74. BACON, BARCLAY. Nasal disease associated with epilepsy. *Brit. Med. Fourn.*, March 19, 1896.

75. MACDONALD, GREVILLE. A case of rhinitis caseosa. *King's Col. Hosp. Rep.*, 1896.

76. GRADENIGO. A case of rhinolith. *Giornale della R. Acad. di Medicina*, No. 10, 1895.

77. BOND, J. W. Maggots in the nose. *Proc. of the Laryng. Soc. of London*, March 11, 1896.

78. RÉTHI, L. The hemorrhages of the upper air passages. *Bresgen's Sammlung*, etc., Hft. 4, 1895.

79. RICE, CLARENCE C. In what manner can ulcerations of the nasal septum following operation and in atrophic rhinitis be healed to secure an even and moist surface? *Med. News*, Feb. 8, 1896.

80. KOPHER, HANS, Dr., Vienna. On nasal thrombosis. *Wien. klin. Wochenschr.*, No. 36 ff., 1895.

81. MCBRIDE, PETER. Lupus of throat and nose. *Med. Chronicle*, Feb., 1896.

82. FREUDENTHAL, W. Rhinoscleroma. *N. Y. Med. Fourn.*, Feb. 1, 1896.

83. SOMERS, LEWIS S. Separation of the nasal cartilages. *N. Y. Med. Fourn.*, Feb. 8, 1896.

84. HETT, J. E. A rapid and rational method for the removal of hypertrophies of the inferior turbinated bodies. *N. Y. Med. Fourn.*, Feb. 8, 1896.

85. ARSLAN. Contribution to tumors of the septum. *Arch. ital. di Otol.*, vol. iii., p. 32.

86. RICHARDSON, C. W. A case of double-pediculated myxo-fibroma. *Annals of Ophth. and Otol.*, Oct., 1895.

87. HARING, N. C. A case of sarcoma presenting in the nasal fossa. *Lancet*, Feb. 22, 1896.

88. MCBRIDE, PETER. A case of fibro-mucous polypus of the naso-pharynx. *Med. Chron.*, Feb., 1896.

89. CHEYNE, W. W. The objects and limits of operation for cancer. *Brit. Med. Fourn.*, Feb. 22 and Mar. 7, 1896.

90. ROY, DUNBAR. Congenital mucous polypus in the nose. *Fourn. Amer. Med. Assoc.*, Nov. 23, 1895.
91. PRITCHARD, URBAN. Congenital partial occlusion of nares. *King's Col. Hosp. Rep.*, 1896.
92. THRASHER, A. B. Congenital osseous stenosis of the nares. *N. Y. Med. Fourn.*, Dec. 14, 1895; *Trans. Amer. Laryng. Assoc.*, 1895.
93. BAUMGARTEN, E. D., Budapest. Occlusions and pseudo-occlusions of the choanæ. *Monatsschr. f. Ohrenheilk.*, No. 1, 1896.
94. DIONISIO, F. Atresia and congenital stenosis of the choanæ. *Giornale della R. Acad. di Medicina*, No. 2, 1895.
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101. BOSWORTH, F. H. A case of melancholia dependent upon ethmoid disease and cured by intranasal operation. *N. Y. Med. Fourn.*, Oct. 12, 1895, and *Trans. Amer. Laryngol. Assoc.*, 1895.
102. LINKENHELD, D., Wiesbaden. Empyema of the maxillary antrum. *Münch. med. Wochenschr.*, No. 8, 1896.
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108. O'KINEALY, F., Surgeon-Captain I. M. S. Hypertrophy of the adenoid tissue in the naso-pharynx: an analysis of one hundred cases. *Indian Med. Gazette*, No. 9, Sept., 1895.

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110. BOND, T. W. Case of chronic spasm of pharynx and soft palate. *Laryngol. Soc. of London*, Jan. 8, 1896.

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68. THOMSON and HEWLETT, after alluding to a previous paper in which they demonstrated the practical sterility of the nasal mucus, and to the investigations of others which prove that expired air is nearly free from micro-organisms, describe the methods adopted by them to prove that the inspired air is free from germs after passing through the nose ; they think that the great majority of micro-organisms entering the nose are arrested by the vibrissæ lining the vestibules, and that any that do enter are expelled by the cilia lining the mucous membrane.

CHEATLE.

69. In a paper read before the Hunterian Society of London, January 8, 1896, SEQUEIRA referred to the fact established by Thomson and Hewlett, that inspired air after passing through the nose is practically sterile, and thought that condition which produced mouth-breathing, especially hypertrophied tonsils and adenoid growths, predispose to diphtheria. He gave statistics which tend to support this.

CHEATLE.

70. ST. CLAIR himself feels as if his suggestions came too late. He advocates antiseptics and recommends sterilization of instruments in 5 per cent. carbolic acid as convenient and sufficient. Sterilization of the nose itself is impossible.

ZIMMERMANN.

71. Owing to an experience gained from the use of bicarbonate of soda upon himself and others, BULKLEY gives to an adult of medium size and weight of from twenty to thirty grains in two to three ounces of water every half-hour for three doses, and a fourth dose at the expiration of an hour from the last one. After two to four hours the four doses are repeated, if necessary, and even twice more. He claims thus to break up the cold at an early stage, but finds this treatment also of benefit at a later period. In influenza it is combined with phenacetine. The treatment is based upon the idea that the acid condition of the system may be neutralized.

M. TOEPLITZ.

72. BOSWORTH does not now consider nasal catarrh of long standing as incurable as he did fifteen years ago. Cocaine constitutes a very valuable progress. Catarrh is not excessive secretion. The turbinated bodies supply an excess of moisture in the expiratory over that of the inspiratory air, upon which fact the treatment has to be based, which consists in preserving the function without destruction of tissue. The septum, which is without function, may be destroyed. Secretions may become offensive by syphilis, but they are *per se* bland; suppuration depends upon disease of accessory sinuses. Necrosis is an expression of constitutional disease. Ethmoid suppuration usually drains into the antrum. The progress of treatment is due to definite diagnosis. Reflex neuroses thus become less frequent and asthma also is better relieved.

M. TOEPLITZ.

73. The recumbent posture alters the topographical relation of the parts to the operator, interferes with proper illumination, and allows the blood to flow into the larynx. SEILER places the patient, after complete anæsthesia, into a ventral recumbent pos-

ture with the head projecting downward, but supported, puts a looking-glass or concave reflector upon the floor, and places himself upon his back under the table.

M. TOEPLITZ.

74. In BACON's two cases of epilepsy treatment of the nasal obstruction brought about considerable improvement. The first case was that of a lady, aged thirty-five, who had polypi in one nostril and hypertrophy of the inferior turbinated body in the other. Case 2: A young, unmarried person with hypertrophy of both inferior turbinated bodies.

CHEATLE.

75. The case was that of a woman, aged thirty-five, who attended MACDONALD's clinic complaining of stoppage in the nose for three months, and fetid discharge from the right nostril, the trouble having commenced with a bad cold in the head, followed by a profuse watery discharge which had lately become thick and yellow. A large, cheesy, putrid mass was found on the right side in the middle and inferior meatus and removed, revealing redness and swelling of the inferior turbinal and polypoid condition of the middle. After removal of polypoid masses from the middle turbinal a cure resulted. Sections of the masses showed a very cellular and vascular new-formed tissue covered with normal epithelium. No evidence of suppuration in any of the accessory sinuses. A very similar case was lately seen by me at the Royal Ear Hospital, cure being rapid and complete under the same treatment.

ARTHUR CHEATLE.

76. A rhinolith of carbonate and phosphate of magnesia which had been formed around a kernel, caused intense headache with purulent discharge from the nose for ten years.

GRADENIGO.

77. BOND exhibited larvæ and flies of *Piophilæ casei* found in the nose.

78. Hemorrhages from the upper air passages are traumatic or spontaneous, due to ulcerations, alterations of the walls of the blood-vessels, or to blood states as hemophilia, leukæmia, anæmia, fatty degeneration, infectious diseases, etc. The symptoms are marked only in more severe hemorrhages, the larynx excepted. Treatment differs according to locality and kind of bleeding. Profuse hemorrhages have to be stopped before the mirror, or other more careful examinations may reveal the origin of the bleeding.

BLOCH.

79. RICE arrives at the following conclusions:

1. Ulcerations upon the nasal septum due to operations heal, according to the general healthfulness, better in hypertrophic than in atrophic conditions.

2. Ulcerations produced by excision heal better than those by galvano-cautery.

3. In healthy nostrils rubbing with antiseptic stimulants should be done, and also in multiple small ulcerations in atrophic rhinitis.

4. Rubbing relieves also extreme irritability of nasal passages.

M. TOEPLITZ.

80. From the examinations of sixteen cases of nasal tuberculosis, and of six cases of lupus of the nasal mucous membrane, KOPHER reached the following conclusions: 1. Nasal tuberculosis may occur in three forms: as infiltration or ulceration, as tumor, and as an affection starting from the bone or cartilage. 2. The ulcerating form entirely corresponds with the tuberculous ulcer of the larynx, histologically, bacteriologically, and clinically. 3. The tuberculous tumor of the nasal mucous membrane is owing to hyperplasia of the lymphatic tissue of the mucous membrane, and corresponds with the tuberculous-scrofulous scleroma (?). 4. The tuberculosis of the bone or cartilage is clinically and histologically analogous to the other tuberculous bone-affections. 5. Lupus of the nasal mucous membrane is the same as that of other mucous membranes histologically and clinically.

POLLAK.

81. McBRIDE describes three cases of lupus. The treatment adopted by him being usually followed by lactic or chromic acid or the actual cautery.

CHEATLE.

82. The continent of America, with the exception of Central America, wherefrom twenty-three cases have been reported, is almost entirely free from rhinoscleroma, since only three cases have here been seen. Hebra's first publication, and also the relations of chondritis hypertrophica inferior and Stoerk's blennorrhœa to rhinoscleroma, which FREUDENTHAL believes to be identical with one another, are then fully considered. This is followed by the report of a case, that of a male patient, aged forty-five, born in Galicia, in whom, twelve years ago, upon the right side at the upper part of the nose, a mass of the size of a pea developed which, five years ago, grew more rapidly and in a year reached its present dimension. At the same time, stenosis of the nose and throat was established, so as to necessitate tracheotomy. The canula, which was removed after sixteen days, had to be reinstated a year ago in order to be worn ever since then. The nose then received a blow from a street car which produced hemor-

rhages from mouth and larynx and increased its growth. The right side of the nose was now as large as a hen's egg, with the top very much thickened, bluish red, and as hard as ivory. The swelling is caused by an enormous enlargement of the right inferior turbinated body, which pushed the septum over to the left side, thus closing both nostrils entirely. Cicatricial masses between the pillars, soft palate, and posterior pharyngeal wall close the naso-pharynx, but for a small opening $\frac{1}{8}$ inch in diameter; the uvula is destroyed. The parts below the epiglottis looked like one cicatricial mass. The bacteriological examination by Mr. B. H. Buxton revealed in cultures and inoculations the characteristic features of the rhinoscleroma bacillus. The case is remarkable on account of the unilateral location of the nasal affections, which is not directly continuous with that of the pharynx.

M. TOEPLITZ.

83. SOMERS's patient, aged thirty-two, presented after an assault, a separation of the anterior nasal cartilages from the nasal bones on both sides, which gave rise to crepitation by the grating of the bones and cartilages against each other, without evidence of fracture. The cartilages were set in place simply by pushing them from the right toward the left. The patient ten years previously had experienced, through a stroke with a shovel, a fracture of the septum, which itself was extremely thickened on the left side by an exostosis. He had also suffered from empyema of the antrum Highmori.

M. TOEPLITZ.

84. HETT claims that posterior hypertrophies of the lower turbinated bodies are produced by cauterizations of their anterior extremities only. He removed posterior hypertrophies from in front by long angular scissors, pulling the severed tissues away by long angular forceps, which may even tear them off if necessary. There is more hemorrhage after this method, but it is more thorough.

M. TOEPLITZ.

85. ARSLAN describes 4 cases of tumors of the nasal septum : 1. Angio-fibro-sarcoma ; 2. Fibro-sarcoma ; 3. Adeno-fibroma ; 4. Inflammatory granuloma.

GRADENIGO.

86. In RICHARDSON's patient, a carpenter, aged thirty, a large reddish-gray mass was seen protruding from the naso-pharyngeal cavity along the inferior border of the soft palate and uvula, filling out the entire space between the lateral, anterior, and posterior walls of the naso-pharynx. Palpation revealed two attachments, a slender one above and anterior to the right Eusta-

chian tube, and the other pedicle, firmer and harder, to the vault just posterior to the left choana. The slender pedicle was freed from its attachment with the finger, while the other pedicle with the growths was evulsed by means of the snare. The tumor was pinkish to the right, deepening to a deep red towards the left mass. It was multi-lobular, consisting of two distinct masses which were joined in the centre; the right one had two lobes. The larger left mass was almost entirely composed of fibrous tissue, while the left presented a myxo-fibrous condition. Measures and weight are not given. Two illustrations of either side of the tumor accompany the paper.

M. TOEPLITZ.

87. HARING's patient was a female, aged twenty-six years, who after having received treatment for what appeared to be ordinary nasal polypi, developed a rapidly growing tumor, which blocked the right nostril, bulged the right side of the nose, and produced epiphora and unilateral right-sided paresis of the soft palate. On turning down the nasal bones and nasal process of the superior maxilla, the growth was found limited to the ethmoid.

CHEATLE.

88. MCBRIDE's case was that of a girl, aged twelve years, whose right nostril was obstructed far back by the polypus, which was attached by a narrow pedicle somewhat to the left of the middle line. Removal was effected by means of Thahle's forceps. McBride calls attention to the fact that this class of polypus is seen most frequently in females; recurrence being rare.

CHEATLE.

89. In the second and third Lettsonian lectures delivered before the Medical Society of London, CHEYNE deals with cancer of the tongue, pharynx, naso-pharynx, and larynx. He does not consider great enlargement of the glands a contra-indication for operation, unless very extensive, or unless there is adherence to a variety of structures in the neck not merely to sheaths of vessels, as the glandular area in the neck can be thoroughly exposed and dealt with. He relates three cases of sarcoma of the naso-pharynx operated by him, two resulting in cure, life being prolonged for two and three-quarter years in the third. He alludes to the bad prognosis of lympho-sarcoma.

In dealing with malignant diseases of the pharynx and neighboring parts, eight cases of extreme interest are related, all requiring extensive operations, a cure resulting in three instances.

Cheyne's views on the question of preliminary tracheotomy, the control of the bleeding, the removal of the glands, and the

methods of gaining access to the primary cancerous mass in these cases, should be thoroughly studied *in extenso* in order to appreciate them. An abstract would be unsatisfactory. CHEATLE.

90. From a review of all cases heretofore reported, the rarity of congenital polypi and those occurring under fifteen years of age becomes evident. ROY's case was in a girl, aged fourteen, who has never been able to breathe through the left nostril. From her fifth to her eleventh year of age large pieces were removed in six operations, partly under chloroform without re-establishing nasal respiration. ROY found the polypus to fill the entire left nasal cavity from the anterior meatus to the nasopharynx. He removed it *in toto* with the snare. The left lower and middle turbinals were found to be atrophied and the upper part of the septum deflected toward the right side, where the inferior turbinate was hypertrophic. The growth was attached beneath the rudimentary portion of the middle turbinate to a space not over a quarter of an inch in length. M. TOEPLITZ.

91. A boy aged nine years attending under PRITCHARD for chronic otorrhœa, was found to have a tough band passing from the inferior turbinal to the septum on the right side; and far back a tough membranous web extending completely across the cavity above the level of the inferior turbinal, having a small opening in its centre. On the left side a band joined the inferior turbinal to the septum. There was no history to account for the condition.

92. A baby, aged eighteen months, a mouth-breather, had muco-purulent discharge from the right nostril anteriorly and adenoids in the naso-pharynx. In passing a curette through the nose, an obstruction was met, before the finger in the nasopharynx was reached. The partition was broken down with the curette; it consisted of thin bone and extended from the septum to the lateral wall at the posterior extremity of the lower turbinal, to which it was not attached. M. TOEPLITZ.

93. Two thirds of the atresia of the choanæ, so far published, are osseous, one third cartilaginous. The former always lie in one plane with the choanæ, the latter mostly towards the nasopharynx. Only those observed in the plane of the choanæ ought to be called "true." BAUMGARTEN saw such an osseous atresia in the right choana of a girl, aged nine, with paralysis of right facial nerve. The diagnosis of congenital lues could not be excluded. In a woman, aged forty, he observed a diaphragm extending from above the choanæ down to the velum; it had a

perforation on right and left side. Something similar occurred in a woman, aged thirty. The pseudo-wall divided the naso-pharynx into an anterior and posterior portion and had a central fissure. Baumgarten thinks that these peculiar formations in the two last cases were not due to lues, but probably to scleroma in that of the lady aged forty. Finally he mentions a case, in which he could observe the process, how a transverse fold formed at the pharyngeal vault from one orifice of the tube to the other.

KILLIAN.

94. A girl, aged twenty-one, without hereditary disease, but with marked adenoid habitus, slight degree of saddle-nose, hard palate more curved than normal, fibrous adhesions between soft palate and posterior wall of pharynx, preventing a digital examination of the naso-pharynx. After the adhesions were severed with a curved raspator, a firm fibrous palate could be recognized, closing the choanæ like a diaphragm. It was perforated from in front.

GRADENIGO.

95. Treats of the anatomical conditions of deviations and spinæ of the nasal septum, whereby the communications of Hartmann ought to have been given due consideration. RÉTHI lays less stress on traumatism than is usually done and emphasizes, in conjunction with others, the discrepancy between the growth of the cranial and facial bones and that of the septum. Réthi distinguishes local and general symptoms and describes the effects of disturbed nasal breathing which we are familiar with chiefly as the consequences of adenoid vegetations. The deviations of the septum only require treatment if they cause obvious disturbances. Then he criticises the various methods.

BLOCH.

96. MAYER recommends the operation devised by Asch in 1883. He breaks with a curved gouge adhesions between the septum and the turbinated body; and makes two incisions one with the blunt edge of the cartilage scissors, over the greatest convexity, and another at right angle. A hollow and perforated vulcanite splint is thus fitted into the formerly stenosed side and a smaller tube also into the concave side; the latter is removed on the following day. The larger tube is first removed on the third day for cleansing and replaced every day to be worn continuously for five weeks. The vulcanite tubes are flat and oval, in sets of twenty-seven different sizes. In acute cases the septum is compressed with the nasal forceps, straightened and held in place by a vulcanite tube.

M. TOEPLITZ.

97. A woman, aged twenty-seven years, under PRITCHARD'S care complained of a hard, red swelling over the left cheek, the swelling none at right. No nasal trouble. On examination the outer wall of the antrum was bulged and distinctly elastic; on introducing a trochar, a drachm and a half of yellow viscid fluid, loaded with crystals, was drawn off. On syringing out the cavity from the opening in the outer wall, the fluid returned through a counter opening drilled through the alveolar border, none passing out through the nose. Examination of the fluid showed it to be alkaline, containing a large amount of mucus, a small amount of albumen and chlorides, cholesterine crystals in large numbers, many nucleated white cells containing fat globules, and some much larger cells containing fat globules.

98. In this interesting article LICHTWITZ reports 147 cases, in 127 of which only one sinus was diseased either bilaterally or unilaterally; in 22 several sinuses in various combinations. The complications affected mostly the surrounding organs, nose, pharynx, etc. Marked atrophies of the turbinated bodies occurred 13 times, partly appearing as ozæna, but they healed, after the sphenoidal sinuses were brought to normal conditions. The reverse took place in 3 cases, where a primary ozæna seemed to have extended to the sphenoidal sinuses. On the other hand, hypertrophies were observed very frequently, in 8 cases preventing nasal breathing entirely. In 3 cases rhinitis caseosa followed—in one after empyema of the antrum of Highmore, and in 2 after empyema of the frontal and ethmoidal sinuses. Small polypi in the hiatus semi-lunaris 12 times, larger mucous polypi 18 times, frequently on both sides, the empyema of the sinus one-sided. From this Lichtwitz infers that the polypi are rather the cause than the consequence of the empyema. One third of all patients complained of (kakosmia) subjective perceptions of disagreeable odors, mostly due to a focus of suppuration detected by an explorative puncture. In regard to naso-pharyngeal catarrh Lichtwitz endorses Ziem's assertion, that they only depend on suppurations of the nose or its accessory cavities. According to Ziem mostly of the antrum, but Lichtwitz found it mostly in empyemata of the frontal and sphenoidal sinuses. Several times swellings and abscesses of the tonsils followed. Of ocular symptoms Lichtwitz saw in 2 cases exophthalmus, in 3 dacryocystitis, in 2 atrophy of the optic nerve (one due to empyema of the sphenoidal sinus). Lichtwitz considers otitis media in adults

owing to empyema of the sinuses as frequent and dependent on the same causes, as otitis media in children with adenoid vegetations. It occurred 35 times; vertigo in 3 and subjective noises in 9 further cases. The most frequent complication is cephalalgia (51), mostly due to frontal and sphenoidal empyemata. Serious intracranial complications were never observed, only once epileptiform convulsions and loss of consciousness after irrigation of the sphenoidal sinus, perhaps caused by transient pressure upon the brain through the not quite intact posterior wall of the sinus. Erysipelas, observed in 5 patients, is, in the author's opinion, to be attributed to an infection by streptococci directly from the diseased sinus. In 2 cases erythema with oedema fugax occurred under antiseptic injections. Lichtwitz's observations of cases that presented the aspect of a grave affection of the lungs, so far mentioned only by Hartmann, deserve especial interest. Lichtwitz observed 7 patients, in whom prominent physicians had diagnosed tuberculosis of the lungs, as they showed the physical symptoms of it. But the remote onset of the disease, the absence of bacilli and a certain wavering of symptoms were not in favor of it. In all cases the pulmonary symptoms promptly subsided after healing of the empyema of the sinus. Probably they were due to subacute inflammations of the pulmonary tissue, caused by constant aspiration of infectious material, especially during sleep. Three further cases of obstinate cough, 5 with asthmatic conditions, belonged in this category. Whether the inflammatory symptoms, occasionally noticed, of the heart, kidneys, muscles, or joints, were of metastatic origin, starting from the empyema of the sinus or not, was doubtful. After some short remarks on the disturbances of the general health, observed by Lichtwitz, he gives the following *résumé* of treatment: opening of the maxillary sinus from an alveolus is the rule, from the fossa canina only, if all teeth are well preserved. The frontal and sphenoidal sinuses are opened from the nose, eventually after resection of the middle turbinated body. Differing from some late publications, Lichtwitz particularly recommends to attempt at least the opening of the frontal sinus from the nose.

ZIMMERMANN.

99. Abscesses of the accessory sinuses frequently exist for a long period and are treated for neuralgia. BRYAN reports four cases of this kind.

Case I. was an *abscess of the right maxillary sinus resulting from dental caries*, in a man aged thirty-nine, the most noteworthy

feature of which was the removal of a portion of a needle, projecting about $\frac{1}{8}$ " beyond the root of the first molar into the antrum, simultaneously with the extraction of this root. The needle had been broken off eight years previously but it was forgotten. The antrum was washed out through the opening made through the extracted tooth. The general health of the greatly weakened patient soon improved.

Case II. was a *suppurative ethmoiditis terminating in caries of the anterior ethmoid cells*, in a man, aged sixty-eight, whose ethmoidal cells were opened by Bryan with the sharp curette and all diseased bone removed. The patient made a good recovery.

Case III. represented an *abscess of the left frontal sinus resulting from nasal polypi and hypertrophic rhinitis*, in a man, aged fifty, whose neuralgic symptoms were greatly increased by an attack of influenza. There existed swelling of the tissues of the left sinus, pains upon pressure and pitting of the skin, numerous polypi, and hypertrophy of the left lower turbinated body which was adherent to a projection of the septum. The removal of the polypi, spine, and hypertrophy sufficed to establish free drainage and considerable improvement.

Case IV. presented *abscesses of the frontal, ethmoidal, and maxillary sinuses*, with caries of the fronto-ethmoidal cells, in a woman, aged forty-eight, who had suffered for twenty years from catarrh, but only for seven months from muco-purulent discharge from the left nostril. The maxillary sinus was opened after extraction of the first molar tooth through its alveolar process, and the empyema disappeared from this cavity in two weeks, although the middle meatus still contained much pus and the severe headaches persisted. Eighteen days after the opening of the frontal sinus an opening was made into Highmore's antrum, from without, with the chisel, $1\frac{1}{2}$ cm in diameter, through which foetid pus was discharged. A drainage tube was passed into the nose, and another inserted into the outer opening. Six weeks later the sinus was reopened, the cavity emptied of granulations and packed, without diminution of the quantity of pus, which now was also again found in the antrum; furthermore, it was noticed that solutions injected into the antrum came out through the frontal sinus opening. About two months after the first frontal sinus operation the septum was found to be perforated and iodide of potassium was therefore given, but without benefit. Three weeks later the anterior ethmoidal cells were found to be dis-

eased, and the middle turbinated body was therefore removed and scraped with a sharp curette, until all carious bone was removed. From that time on the patient's condition rapidly improved to complete recovery, and the patient was discharged cured after ten months of observation. The description of these cases is followed by general remarks upon suppuration of the frontal and ethmoidal sinuses, and a discussion of its etiology, diagnosis, and symptomatology. The deeper or fronto-ethmoidal cells, as well as the absence of one of the three opening in the middle meatus, are represented by an illustration. Three additional illustrations demonstrate the ethmoidal cells and sphenoidal sinus. The paper is concluded by indications of the different operative procedures and a brief account of sphenoidal disease.

M. TOEPLITZ.

100. A man, aged thirty-three, had suffered for years from a suppuration from the left nostril, and during the last few months also from that of the right one, with offensive odor and occasional headaches. On the 27th of January he was suddenly seized with intense and persistent headache confined to the left side of head and face, without fever or brain symptoms. BOSWORTH found, four days later, the wall of the ethmoidal cells soft and crumbling, and the sphenoidal sinus invaded. He attempted to open the latter by a sharp-pointed gouge, which procedure was followed by temporary relief. Eight days subsequently another operation was tried by means of a burr, three sixteenths of an inch in diameter. On the next day an intense chill set in, and death ensued after twenty-four hours. Bosworth thinks that the fatal issue was due to brain abscess, which had lasted but twenty-four hours, and had been caused by sphenoidal suppuration; that the latter had lasted but thirteen days, and had developed from an old, neglected ethmoid suppuration. He considers sphenoidal disease to be of very rare occurrence and dangerous character, while ethmoidal disease is by far more frequent, and without much danger.

M. TOEPLITZ.

101. BOSWORTH's patient, a man aged forty-two, had, in 1876, contracted influenza, followed by hay-fever. In 1881 he developed a sort of melancholy, at first periodical, later on permanent. He complained also of a feeling of swollen eyes and of pressure between them. He tried all sorts of treatment from climatic and dietetic changes to surgical means, such as Baunscheidt, removal of stricture, castration, ligation of the pubic artery, and enuclea-

tion of a healthy eyeball. As a last resort, he submitted, in 1891, to an examination of the nose, which, in its right nostril, was found stenosed by an angular deviation of the septum, while the left side was filled by extreme hypertrophy of the turbinated body, covered by myxomatous tissue. The removal of the projecting septum and of the swollen turbinated body were followed by prompt relief, not only as to the aprosexia but also the mental and moral condition. His hay-fever also was cured. Bosworth believes, that the melancholia was directly due to ethmoid disease, viz., to some organic change at the base of the brain established by the former condition.

M. TOEPLITZ.

102. We agree with the author, when he says that the healthy or diseased condition of the maxillary antrum may be demonstrated by transillumination or an exploratory puncture, even if so-called typical symptoms are lacking, and that an affection of the antrum may be ascertained as the cause of hemicrania, neuralgia, etc., where the inspection could not reveal any characteristic secretion in the middle nasal meatus. Not everybody, however, will agree with LINKENHELD, if he sees cogent indication for an operation in the purulent or chiefly purulent or even putrid character of the fluid liberated by the puncture, as extensive resection of the anterior wall, curettement of the antrum, making a counter-opening in the nasal wall, if the teeth are healthy, partial resection of the inferior wall by removal of the alveolar process, and additional counter opening towards the nose, when the teeth are carious. The after treatment is according to general surgical principles. (We know that the most putrid empyemata not unfrequently heal after a few irrigations.) Linkenheld scarcely uses irrigations when the nose is blown. The air current, passing through both openings, cleanses the antrum. The external opening is lightly covered with gauze, which is removed when the patient wants to blow his nose. In very many cases scraping has to be repeated and the openings enlarged. Nothing is said of the time of treatment required for a perfect cure.

ERH. MUELLER.

103. With reference to a case of Combe, in which a drainage tube of tin, $2\frac{1}{2}$ cm long, had remained in the maxillary antrum for four years, and then passed the nose, embedded in cheesy masses, ZIEM opposes the employment of obturators and drains after opening the antrum, as they protract the healing, and no food enters the antrum even without them. But not only pieces of canulas or

plugs may break off and enter the maxillary antrum, but also pieces of the drills used in operations, particularly if from the inferior nasal meatus a great force is employed. He again recommends to make a hole in the alveolar process with the drilling machine. In order to remove a piece of the instrument that has been broken off, he introduces a wire bent like a hook behind it and extracts it. (He did this twice successfully.) Irrigations may be used before resorting to Roser's bone forceps or to making a large opening.

KILLIAN.

104. ROSE's case was that of a boy aged fifteen years, admitted with an abscess in the frontal region. Two operations were performed, but death occurred. At the post-mortem examination, necrosis of the sphenoid was found, with purulent meningitis, pus in the sphenoidal sinuses, and septic pulmonary infarcts.

CHEATLE.

105. DAY's patient, a physician, in 1884, cut his finger while operating, which resulted in severe blood poisoning. In 1891 he declined much more, suffering from frontal headache and extreme chilliness. During the summer 1892, the vault of the pharynx appeared eroded, and subsequently a small carious area was detected at the spheno-vomer articulation, from which a small piece of bone, of the size of a pea, was removed. Foul pus was discharged from the sphenoid and ethmoid, indicating the progress of caries. The body of the sphenoid and the basilar process of the occipital bone now became disintegrated. A quantity of carious bone was removed from the nostrils. The patient became very feeble.

Diagnosis: Necrosis of the base of the skull. Symptoms of brain abscess developed. Suppuration of the lymphatic glands on the left side of the neck. Death.

The post-mortem revealed a brain abscess springing from the centre of the right sphenoidal wing, through the temporo-sphenoidal lobe to the internal auditory meatus. Pus passed the foramen rotundum and pierced the wing of the sphenoid to the orbit, and the anterior ethmoidal cells. The entire body of the sphenoid and basilar process of occipital bone, the pterygoid processes, and ascending rami of the palatine bones were carious and loose. The vomer was entirely gone, and also the perpendicular plate of the ethmoid. The antra and frontal sinuses were intact. Dura on the clivus exposed.

M. TOEPLITZ.

106. The greater frequency of hypertrophy of the pharyngeal

tonsil and its sequelæ at the seashore is evident. The climate seems to be an important factor, since all races are equally affected. Other causes are measles and scarlet fever, and, above all, heredity, as pointed out by THOST. E. Fraenkel demonstrated on the cadaver, that the hypertrophy may be congenital. Thost considers residua of purulent otitis media and progressive hardness of hearing as signs of former adenoids. He removes the hypertrophied tonsil, generally in superficial narcosis, with Gottstein's knife, as radically as possible. The attention of the aurist is called to formations of bands in Roensmüller's fossæ extending from the ridges of the tubes towards the roof of the pharyngeal vault, which may constrict the tubes. Thost cured in such a case hardness of hearing and otalgia by cutting the band. He observed simple, catarrhal, or such inflammations which corresponded to angina lacunaris, abscesses with severe typhoid or meningial symptoms. In diphtheria, the tonsil may be destroyed by ulceration.

Peculiar are those cases in which scarlet fever developed after the operation, which has also been observed by B. Fraenkel. The increased swelling of the pharyngeal tonsil, which influenced the parents to bring their children to the surgeon, may be an initial symptom of scarlet fever. Perhaps the infection first entered here. In syphilis Thost saw papulæ and ulcers on the pharyngeal tonsil. Tuberculosis probably is more frequent than generally diagnosed. E. Fraenkel found it in ten out of fifty tuberculous patients. Thost found the pharyngeal tonsil affected in a case of lupus.

Hypertrophy of the pharyngeal tonsil regularly leads to swelling of the lymphatic glands of the superficial cervical plexus in the lower triangle of the neck, behind the sterno-cleido-mastoid muscle. In simultaneous hypertrophy of the faucial tonsils, the submaxillary glands are swollen. The frequent ear affections produce glandular enlargement before and behind the ear, the eczema of upper lip and chin, glandular enlargement under the chin. Of especial importance in diseases of the pharyngeal tonsil are two retropharyngeal glands next to the rectus cap. ant. maj. muscle, which swell, and may suppurate. Acute inflammation of these is mostly accompanied by a peculiarly inclined and laterally turned position of the head.

In enuresis nocturna, asthma, stammering, the results of removal of the pharyngeal tonsil often are not quite satisfactory,

but they are prompt in pavor nocturnus and headache. Swollen turbinated bodies often require special treatment. Many adults affected with them formerly suffered from adenoids.

KILLIAN.

107. EAMES does not believe that adenoid growths cause irregularities of the teeth, but rather that the latter are another expression of the same cause, which, although producing the adenoids, need not produce both in the same case. Neither the constant atmospheric pressure, nor the partial vacuum in the nose and naso-pharynx caused by deglutition, nor the dropping of the lower jaw with subsequent flattening of the lateral alveolar arches, nor the expansion of the lower jaw by the weight of the tongue, are the causes of the high-arched palate with irregular teeth. They are due to an arrest of development of the bones of the nose, together with chronic hypertrophy of the turbinated bodies. Eames presents, in confirmation of his views, models which exhibit well-formed arches in connection with large quantities of adenoid vegetations.

M. TOEPLITZ.

108. Of 461 patients examined by O'KINEALY in the Out-patient Department of the Medical College, Calcutta, 100 were found to be suffering from adenoid growths, a percentage of 23.8. Of the total number examined, 171 were Europeans, of whom 61 were affected; the remaining 290 being natives, of whom 39 had adenoids, or 13.4 per cent. The native group includes Hindoos, Mohammedans, and native Christians from all parts of the country.

CHEATLE.

109. FLATAN discusses the hearing dumbness (dumbness without deafness—Schmalz), with and without psychical defects. Associated with it adenoid vegetations (H. Gutzmann) and disturbances in the nose itself are found. Then rhinolalia clausa and aperta according to causes and therapeutic methods, and lisping, which also may be due to nasal affections. Finally stammering in its relations to diseases of the upper air passages is shortly discussed.

BLOCH.

110. BOND's case was that of a man aged thirty-three, who sought advice for deafness which was due to adherence of both mallei to the promontories. In the course of examination his pharynx was found to move in a rhythmical manner, horizontally, towards the left side and back again, the soft palate being drawn up to the left side with each movement of the pharynx, these clonic spasms continuing without intermission. Nothing abnor-

mal had been felt by the patient, who thought his throat healthy. No sound could be heard accompanying the spasms either by the patient or by others.

CHEATLE.

111. To the very rare cases, so far observed, a case of myxosarcoma is added. In a young man a pretty solid tumor developed, thickening the posterior wall of the pharynx down to the tongue, and causing difficulty of swallowing. It was pediculated, and sprung from the surface of the soft palate. Choanæ and naso-pharynx were free. After free application of cocaine the tumor came easily away with the snare in two portions. It was non-malignant according to the histological examination. Some therapeutic remarks are added.

ZIMMERMANN.

112. After discussing in detail the latest pathological, anatomical, and bacteriological articles on the hypertrophy of the tonsils, FERRERI and GARBIN report their investigations with cultures and inoculations of animals. They tried to exclude as much as possible the micro-organisms, which are found in the mouth of healthy persons, and from there invade the crypts of the tonsils. Virulent pyogenic cocci were found in all tonsils examined. The authors infer from this that the chronic hypertrophied tonsils are latent foci of an eventual general infection. Hence the galvano-cautery or ignipuncture is deprecated, and the radical abscission recommended.

GRADENIGO.

113. FARLOW removes the tonsils of children under anæsthesia with an *écraseur* before removal of the adenoids. He uses a modification of Hooper's *écraseur*, which he straightened, provided with a flattened and widened canula and longer screw, and armed with piano wire No. 7. The heated wire is rejected by him. In children without anæsthesia he prefers the guillotine. In adults, however, he prefers the *écraseur*, except for cases better adapted for the amygdalotome. In deep-seated tonsils, or such adhesive to the pillars, and for trimming, Farlow uses Ruault's punch or Hartmann's conchotome, and with more advantage after cutting the surface with knives and scissors. The treatment with galvano-cautery takes too long, but is useful in bleeders, in adhesive tonsils, and for the destruction of follicles.

M. TOEPLITZ.

114. The first of NEWMAN'S cases was that of a man aged fifty-five, who had had an epithelioma, involving the upper third of the left tonsil, posterior pillar, and left side of the uvula, removed in 1890. The second, that of a woman aged fifty-one,

who had had a carcinoma, situated in very much the same position as in the first case, removed in 1891. The operations were done through the mouth with the galvano-cautery, a preliminary tracheotomy being performed in the second case. There was no recurrence in either up to the present time. CHEATLE.

115. The chief symptoms of ROTH's case were : Continuous fever for eight days, very severe pain in swallowing, in the ears and occiput, and obstruction of the nose, precluding completely normal breathing. The abscess opened spontaneously.

POLLAK.

116. KELLER's case differs from those heretofore published in the following points : 1. Bilateral occurrence of herpes on the hard and soft palate, the palatine arches and epiglottis, without affection of the larynx. 2. The lack of any herpetic eruption on external skin and lips. 3. The nasal mucous membrane remained perfectly intact. 4. The subsequent paresis of the velum palati.

POLLAK.

117. CHAPPELL's Case I. (own observation). A female, aged forty-six, complained of dryness of eyes, nasal fossæ, mouth, larynx, and trachea. The attacks of dry sensations in the eyes and nose, exciting her to rub the parts, began in 1889, intensified during menstruation, were the mildest between two periods, increasing again toward the expected one. With the progress of the disease they extended farther down toward the trachea with increase of urination and, in 1893, simultaneous sudden swelling of the parotid glands, which subsided in a few days. The dryness continued even after the menstruation had ceased entirely. Treatment was of no avail and patient finally died when complete paralysis had developed.

II. A female complained after influenza of constant pain in the roof of the mouth on one side of the middle line and occasional pains in the temples and eyes. The buccal dryness is extreme.

III. A female, aged sixty, suffered after a shock from headache, insomnia, and intermittent deafness. In 1890, she began to feel the dryness of the mouth. The mucous membranes were pale. There was difficulty in swallowing dry food. The teeth were decayed. Pilocarpine in small doses produced some moisture. Blue litmus paper rubbed with dry tartaric acid required forty-two seconds over the tongue, and thirty seconds over Wharton's duct to change the color. All these cases are considered to be of central origin.

M. TOEPLITZ.

118. MYLES's paper is the continuation of the one reviewed in these ARCHIVES, 1895. Transillumination is considered very valuable, particularly in antral affections. A unilateral umbra on the lower conjunctiva with absence of crescentic illumination on the lower lid, and absence of the perception of light, when the eye on the same side is closed, will frequently, particularly in blond and thin persons, prove an affection of the antrum. The electric tubular lamp placed above the inner canthus is only corroborative of diagnosis of frontal sinus disease. The character of the secretions flowing from the natural opening and their location, which is not always possible, will add more certainty to the diagnosis.

In locating the discharges from the antrum or sphenoidal sinus, the head has to be bent downward in order to obtain the greatest flow. If all these measures fail to establish the diagnosis, irrigation either through the natural opening with syringe and curved tube, or with the trocar and canula either from the nose or fossa canina, will accomplish it.

For treatment, irrigation through the natural opening should be tried and persisted in for a few months, but then an opening of from 8 to 10 *mm* in diameter is made through the molar ridge over the tip of the first molar, or, to save the tooth, in the canine fossa.

Patients with antral disease rarely locate their pain in the antrum, but in the supra-orbital, temporal, or occipital region, whilst in those of other sinuses it is there located.

Myles treats the acute sinusitis with open foramen prophylactically, the acute and subacute cases with occlusion of the normal outlet by means of irrigation or penetration with trocar and canula. Polypoid degenerations are removed through large counter-openings; adontic periostitis with or without caries is best treated through the molar ridge. For atrophic rhinitis, irrigation and curetting are used. Gummata are laid bare and scraped. Tumors can be recognized and removed by surgical procedures.

Myles recommends the malleable handle curettes for diagnosis and treatment and the headed rubber tubes for drainage.

He appends another series of twenty-one cases, which are very instructive for the greater part, by their excellent, for the smaller part, by their negative results.

The original is highly recommended to the reader for the original views and methods of the author. M. TOEPLITZ.

119. FREEMANN devised, for the *Dessault-Küster* operation through the fossa canina a hand drill, the blade of which cuts in both directions by a series of half turns ; the diameter of the perforation is $\frac{1}{8}$ inch. Intra-oral operations are best done under general anæsthesia. Freeman uses for intranasal operations a straight trocar and canula, perforating the outer wall of the nose with a few taps of the mallet, close to the floor, low down and more anteriorly in the lower meatus, thus avoiding the lachrymal duct, which is situated 30 to 35 mm from the naso-labial junction with its exit high under the turbinal. The canula is, after perforation and after removal of the nuts, withdrawn and a drainage tube is slipped over the trocar, which is then also withdrawn. Through the permanent drainage tube, the sinus is washed out with a long silver tube (wash tube). This method keeps the perforation open and enables the patients to treat the cavity themselves.

M. TOEPLITZ.

120. CARR advocates the opening through the alveolus and militates against the nasal operation. He considers metal drainage tubes dangerous through infection and irritation ; silver tubes corrode easily. A plug of sterilized gauze is the best means of closing the opening.

M. TOEPLITZ.

121. The diagnosis of antral disease cannot be made by one sign only, but by the combined consideration of all, of which transillumination is considered the most important. BROWN recommends for treatment, first, after removal of polypi, granulations, or hypertrophies of the middle turbinates, the direct treatment of the suppuration by the direct irrigation through the ostium maxillare ; secondly, opening through the inferior meatus by means of a trocar ; thirdly, drilling through the alveolus ; fourthly, opening through the canine fossa ; and fifthly, the combinations of the latter method with the perforations from the inferior meatus. He reports four cases of antral disease, all of the left side, two of which were operated by the drill in the canine fossa, one by irrigation from the natural opening and one by drilling through the alveolus of the first molar. Three of these cases were cured and one greatly improved.

M. TOEPLITZ.

122. All cases of papillary hypertrophies or papillary fibromata reported as papillomata are not true papillomata in the sense of Virchow. In addition to the only authentic case of nasal papilloma reported by De Santi in the *Lancet*, 1894, WRIGHT gives a case occurring in a woman aged twenty-eight,

who presented in the left nostril a globular, flattened, freely movable, pedunculated mass of about one *cm* in diameter attached to the upper part of the cartilaginous septum about two *cm* from the columna and subjected to the attrition of the plica vestibuli. The pedicle is composed of fibrous tissue which sends out papillæ covered with columnar epithelium; the latter are proliferating profusely, the stroma is scanty, but extremely vascular. The epithelium forms digitations. No prickle cells could be found. An illustration is appended. Another similar tumor from the septum of a five-year-old child has lately also been histologically examined by WRIGHT. M. TOEPLITZ.

123. While THRASHER believes, that of all accessory cavities, the ethmoidal cells are most frequently diseased, he considers necrosis of this bone to be very rare. The necrosis may be produced by the pressure of polypi, as well as the latter are caused by ethmoiditis. There is also a causal relation between the cysts of the middle turbinate and necrosis. Thrasher appends two cases of necrosis of his own observation and prefers for their cure the cold snare with subsequent curetting.

M. TOEPLITZ.

124. WRIGHT is not in accordance with Tornwaldt's views on the frequent occurrence of cysts of the bursa pharyngea, but believes that they are very rare, and that the bursa pharyngea is due to chronic inflammation. Cysts may be found by inclusion and are thus lined with squamous epithelium, as in the case reported in these ARCHIVES, 1895, by Lamphear, or they may originate through retention from the oblong lymph spaces, near the base of the folds, which are lined with a single layer of endothelial cells and are well illustrated by a drawing. In Wright's first case, the cyst was located in the roof of the pharynx near the septum, in a colored woman treated for ethmoid disease. The cavity has no lining, and near one side is an oblong space, also without lining, thus confirming the view of its development by retention. The second cyst was located at the base of the right posterior faucial pillar, lined with squamous epithelium, and was probably an inclusion cyst. The microscopical sections of both cysts are well illustrated.

M. TOEPLITZ.

125. RAVOGLI reports four cases of ulcers in the pharynx, of the size of a dime, dark red, with a deep centre, which occurred from two to three years after the initial lesion, in four men addicted to the use of alcohol and chew-tobacco. He considers

the lesion as a late secondary. The affection is painful and connected with fever. The ulcers when properly located healed with a superficial whitish scar. These manifestations are rare.

M. TOEPLITZ.

126. The circumscribed inflammations of the upper air tract, as result of vasomotor disturbances, such as hay-fever, nasal hydrops, rhœa, asthma, etc., are not reflex in character; furthermore, the greater susceptibility of the mucous membrane through inflammation, which is a contributory, not an exciting cause, does not explain these manifestations either, which, thirdly, may be the result of the action of some localized morbid process upon the vasomotor centre in the medulla or upon the secondary centres in the gray matter of the cord. BOSWORTH, without entering the obscure question of reflex action, explains the vasomotor disturbances associated with ethmoid disease, viz., aprosexia, by the intracellular pressure crowding upon the base of the brain, disturbing the circulation, which presses directly upon either the primary or secondary vasomotor nerve centres. The polypi may also cause reflex neurosis.

M. TOEPLITZ.

127. After a careful review of the cases reported by Hutchinson, Hadden, Osler, and others, RIESMANN gives a case of his own observation, which occurred in a woman aged thirty-eight, suffering, apart from headaches and abdominal cramps, from a dry, pasty sensation in mouth and throat, and from burning pain in the tongue and tension in the face. The tongue was studded on the median surface with petechial hemorrhages. Treatment proved futile.

M. TOEPLITZ.

128. KOPLIK described in a former paper (*N. Y. Med. Journ.*, 1891) a series of cases, occurring in one family, one with a simple catarrhal angina, another with a severe non-membranous angina, and a third of fatal diphtheria with membrane, all of which presented large numbers of virulent Loeffler bacilli. Another set of cases exhibits a minute speck of membrane upon the pharynx; a third set shows pultaceous deposits; a fourth, necrotic ulcerations of the tonsils. The most important atypical cases of diphtheria are those which resemble a simple lacunar tonsillitis. In a second paper (1894), these cases are divided into three groups: First, exceedingly mild cases; secondly, those with more pronounced local and constitutional symptoms; and, thirdly, those with malignant features from the outset, with coagulated exudate upon the tonsil after the first few days. The

bacilli were found in the depths of the lacunæ in all three groups. They are in all of equal virulence and retain it during convalescence. This is important for the prophylaxis. The diagnosis can only be made by bacteriological examination, and, if found diphtheritic, the case must be isolated. Mild cases can only be explained by immunity.

M. TOEPLITZ.

129. Ludwig's angina is an intensely infectious phlegmon, which occurs under peculiar anatomical conditions. No special infectious germ has been established as the only cause of the disease. The autopsies reveal a general disorganization of the cervical cellular tissue and muscular substance. The infection may be excited from oral glands, ulcers of lips, dental caries, and tonsillitis. The pus originates in the so-called sublingual portion of the floor of the mouth, the apex of which is formed by the place of contact of the mylo-hyoid and genio-glossus muscles, the base by the tongue, the external wall by the inferior maxilla and mylo-hyoid muscle, and the internal wall by the genio-glossus and myo-glossus muscles. The space contains the sublingual glands, which are the starting-point of the affection, but the submaxillary also may be secondarily affected by penetration of its sheath or by invasion into the submaxillary region through the mylo-hyoid muscles. The subhyoid region is not implicated in this disease. The symptoms are constitutional, of a sthenic or asthenic type, or local; then, with wooden-like induration, thrusting up the tongue, dyspnoea with laryngeal œdema, and swelling internally from the dental arcade. The prognosis is grave. It occurs most frequently among males and during the third decade of life. The best treatment is early lateral incision to relieve tension through the mylo-hyoid muscles.

M. TOEPLITZ.

130. The instrument is $7\frac{3}{8}$ " long, $3\frac{1}{2}$ " being the handle, $3\frac{3}{8}$ " a delicate shank. The cutting part is placed at an angle of 45° with the shank, the blade being $\frac{1}{2}$ " long, probe-pointed, $\frac{1}{8}$ " broad, and the cutting edge curved. The blade is notched near the probe-pointed end on the cutting surface. The instrument is made of steel in one piece by the Ford Surgical Instrument Company, New York.

TOEPLITZ.

131. At the end of the straight canula of Wright's *écraseur* VEEDER places an oval-ringed canula with a central groove for the wire, which is withdrawn by the circular screw. Other attachments for the removal of growths at the base of the tongue and at the larynx are also devised.

M. TOEPLITZ.

132. There are but 32 cases of angioma of the tongue on record. HULEN's patient, a woman, aged forty-three, had the tumor for more than twenty years, probably longer, always of the same size, causing but slight impediment of speech. The tumor was located 3 *cm* from the tip of the tongue on its left side, was bluish, globular, with vertical rugæ and some small nodes on its lower surface, soft, spongy, and easily emptied. It measured 3-4 *cm* antero-posteriorly, 3.2 *cm* transversely, and 3.5 *cm* vertically. A good illustration is given.

M. TOEPLITZ.

133. All cigarette smokers inhale as far as the bronchial tubes with superficial inspirations. They absorb more nicotine than the cigar smokers by the more frequent dose. The effects are local and constitutional. The latter are only those of nicotine poisoning, which are extremely injurious in youth, and not so much so, but still harmful enough in adolescence. The evil is the more reprehensible, since it is more easily acquired than cigar-smoking. The local effect consists in the production of a trivial hyperæmia and secretion. An existing throat or nose trouble may be, directly or by its constitutional depressing effect thereby aggravated.

M. TOEPLITZ.

AUSTRIAN OTOLOGICAL SOCIETY.

SESSION OF FEBRUARY 25, 1896.

Chairman, Prof. GRUBER.

Secretary, Dr. KAUFMANN.

1. KAUFMANN reports a case of perisinuous abscess with pyæmia cured by operation in Politzer's clinic :

A girl, aged twelve, with chronic otitis media suppurativa was suddenly affected with chills, loss of consciousness, and vomiting, sleeplessness, headache, and vertigo. When admitted the patient was somnolent. Temperature 38.5° , repeated vomiting. External meatus filled with offensive thick pus. The radical operation reveals cholesteatomatous masses and granulations in mastoid process, middle ear, and attic. The sinus is laid open along its whole course in the temporal bone. It is surrounded by much pus of very thick consistence, its wall is discolored, but it contains liquid blood. After the operation normal temperature. Recovery.

2. GOMPERZ demonstrates a patient with congenital abnormalities at the pharyngeal tubal ostia and formation of diverticles at the roof of the naso-pharynx. A prominence 3 to 4 mm high, 2 mm wide, stretched from one orifice of the Eustachian tube to the other, along the roof of the naso-pharynx, and formed a vault over the choanæ, having the same concavity as the pharyngeal vault.

3. POLITZER demonstrates some preparations showing defects of bone in the lateral wall of the attic. Politzer thinks that inflammatory agents and septic cocci enter the bone and destroy its tissue, if the margin of the incisura Rivini is laid bare by septic suppuration, which is the rule in this locality. The longer the suppuration keeps on, the more extensive is the destruction of the

bone. The subsidence of the suppuration therefore may terminate either with a small or a very large bony defect of the attic.

4. ALOIS KREIDL demonstrates a cat, in which he had destroyed both auditory nerves a year ago according to a modification of Ewald's method. After a year the animal exhibited the following symptoms: Audible sprawling gait, constant movement of the head, awkwardness in grasping its food and in jumping, various disturbances of equilibrium, wanting of galvanic reaction. Kreidl attributes these symptoms to a lack of the organs of equilibrium in the internal ear. The middle ear is intact. The labyrinth also shows no changes, except some as seen in leukæmia. This case is the first in which Ménière's disease was caused by an isolated affection of the auditory nerves.

FERDINAND.

5. ALT. Post-mortem of a case of Ménière's disease (leukæmia).

Alt reports on some work done by him with Dr. Frederick Pineles. A laborer, aged sixty-six, who, up to the winter of 1894, never was seriously sick, commenced to complain of headache and weakness. June, 1895, he fell unconscious with vertigo and tinnitus, and had almost entirely lost his hearing when he came to. A total loss of hearing occurred after fourteen days. The patient stayed in bed ever since and had frequent attacks of vertigo. July, 1895, he entered the first medical department of the general hospital. Here the diagnosis was made: High degree of myelogenous leukæmia (2,600,000 red to 600,050 white blood corpuscles about 1:4, numerous mono-nuclear cells, large leukocytes, myeline cells with lymphocytes, a few nucleated red blood corpuscles, enormous tumor of the spleen, very large liver, extensive hæmatomata). The examination of the ears revealed both *Mtt* very much retracted, opaque, light reflex displaced. T. F. C₂ not perceived from vortex. C₂, C₁, and C not heard in front of left ear, nor from the left mastoid process. The tuning-forks C₂, C₁, and C, when very intensely struck, heard very shortly in front of right ear, not at all when placed on the bone. Very loud voice only next to right ear; to left, total deafness. Currents of 15 to 20 M.-A. do not cause any vertigo.

Death September 8, 1895.

Post-mortem: Myelogenous leukæmia with suppurating leukæmic hæmatomata. Both temporal bones and the brain were more carefully examined. The brain and auditory nerve, treated ac-

according to Weigert-Pal's method, presented the following changes : Very large and small leukæmic small-celled infiltrations at numerous places of the *intramedullary portion of the auditory nerve*, as well in the lateral as in the medial radix of the auditory nerve. The exit of the auditory nerve, where both radices coalesce, is especially much infiltrated, the pia slightly thickened and infiltrated with small cells. A degeneration is noticeable in some points of the auditory fibres. The auditory nuclei, the posterior corpora quadrigemina, cerebellum, do not show any pathological changes. *Hemorrhages or residua of hemorrhages are nowhere to be found.*

BOOK REVIEWS.

I.—Atlas der Beleuchtungsbilder des Trommelfells (Otoscopic Atlas). By Prof. A. POLITZER. With 392 chromolithographic pictures of the tympanic membrane and 67 drawings in the text. W. Braumüller, Vienna and Leipzig, 1896. Price 20 marks. [\$5.]

The new gift, in book form, which A. Politzer—the famous otologist, who by his knowledge, talent, perspicacity, and industry stands unrivalled among his fellow-specialists—has made to the medical profession, consists of a splendidly gotten up large octavo volume of 150 pages and fourteen plates; each containing 28 colored figures, all drawn from nature by the author. Thirty years ago he published a smaller work of the same kind, two plates with 24 colored figures, accompanied by a less extensive text with 13 illustrations. The present work is the fruit of unremitting labor during a lifetime. The text, a systematic and exceedingly clear and practical presentation of the theory and practice of otoscopy, deals in a most instructive way on the anatomy and the visible diseases of the parts concerned in this special study. The pictures of the plates are so grouped together as to represent the varied appearances of the different diseases in their successive stages. The otoscopic condition represented by each picture is concisely explained, and supplemented by a sketch of the history of the case, as well as a reference to the place where the general description of the patient's disease is to be found in the preceding text. To the student the book will be a most useful guide, and to the aural practitioner it will serve as a very interesting and useful review of his own experience.

We agree with the author when he says that the diagnostic explanation of the otoscopic conditions of the membrana tympani is much more difficult than is commonly supposed, and we add

that we consider it also more difficult than the correct interpretation of the various ophthalmoscopic pictures of the fundus oculi. The latter are very much larger, mostly much brighter, and better differentiated than the former. On the other hand, otoscopy has the great advantage over ophthalmoscopy that its objects can be examined not only with the eye, but also with the senses of hearing and touch. Inflation, the auscultation tube, and the pneumatic speculum inform us of the whistling perforation, the gurgling and displacement of liquids within and without the tympanic cavity, and the mobility of the membrana tympani, whereas the probe, the almost constant companion of the painstaking aural diagnostician, verifies or corrects in a multitude of cases our ocular impressions of the numerous, heterogeneous, and changing conditions of the parts crowded together at the medial end of the external ear canal.

H. K.

II.—*Traité de Chirurgie Cérébrale*. By A. BROCA and P. MAUBRAC. Grand octavo, 582 pages with 72 figures in the text. Paris, Masson & Co., 1896. Price 12 francs. [\$2.50.]

The first chapter gives a concise description of the topography of the brain, based on embryological and comparative-anatomical data. The second contains the methods, apparatus, measurements, and delineations by which the situation of different portions—convolutions, fissures, etc.—of the brain can be traced on the external surface of the skull, if surgical interference comes into question. The third and fourth chapters treat of cerebral localization from a physiological, pathological, and diagnostic point of view, in particular the motor and sensory symptoms, both in cerebral and cerebellar disease, and of the diagnostic value of these symptoms. In the fifth and sixth chapters are described the technique and dangers of cerebral operations, in particular the advantages and disadvantages of trephining and chiselling. These six chapters—130 pages—form the *general part* of the subject.

The *special part* treats in its first chapter, very clearly and with much knowledge of detail, of the traumatic brain lesions amenable to surgical treatment. The second chapter, which will interest our readers most, contains in exactly 100 pages an excellent presentation of the **intracranial complications of purulent otitis media and their treatment**. The authors insist on the importance of prophylaxis,—that is, the proper appre-

ciation and care of the primary ear disease,—and refer to the treatise by one of them (A. Broca and Lubet-Barbon, *Les Suppurations de l'Apophyse Mastoïde et leur Traitement*, Paris, 1895), which we took pleasure in reviewing and recommending to our readers last year (these ARCHIVES, vol. xxiv., p. 250). The intracranial complications of ear disease are described under the heads of meningitis, sinus-phlebitis, and abscess, the latter being epidural, cerebral, or cerebellar.

The authors state that in acute diffuse meningitis medical art is powerless, but partial and sub-acute meningitis may sometimes be cured by an operation. Broca details two cases of fatal acute meningitis from his own observation, and a considerable number of his own and foreign cases in which more or less marked symptoms justified the diagnosis, but where recovery with, and sometimes without, operation took place. In some of the cases the mastoid and cranial cavity were opened, in some also the dura was incised; no pus was found, yet the patients recovered. They call these cases pseudo-meningitis or meningism, an attenuated form of meningitis, and explain them by the consecutive œdema and even pus which surround a focus of active suppuration, and disappear when the primary focus is stamped out. They compare it to the peritonism which frequently complicates circumscribed peritoneal, and even juxta-peritoneal, inflammation. The authors quote Körner for the observation that such cases, especially in children, may end fatally, and at the autopsy nothing but œdema of the meninges and the brain is found. Such cases have been described quite recently under the name of meningitis serosa. In all doubtful cases the authors advise operation (tympanum, mastoid, cranium, according to conditions found), and not to lose time with simple procedures, the air douche, for instance, “the efficacy of which, however, is great in many patients (*dont l'efficacité est cependant grande chez bien des sujets*).” We could not concur in this last assertion; on the contrary, we would consider inflation even dangerous in cases of acute suppurative otitis media, knowing by personal and other experience that it has been followed by immediate increase of pain and inflammation.

The picture of *sinus-phlebitis* is very carefully and accurately drawn. The pathogenesis, development, varieties, and different terminations of this affection are detailed from personal observations (the first three fatal), and a very careful appreciation of the

incident, quite abundant literature. The authors cite the cases where sinus-phlebitis with pronounced pyemic symptoms have been cured by an operation on the mastoid only. Yet they do not consider this a sufficiently safe procedure in such cases (an opinion which the reviewer shares, though the authors give him credit for two cases cured in this way), but advise to remove gently all the points of diseased bone that yield to the cutting edge of the curette. Then, as a rule and according to the conditions found, the epidural collection of pus should be wiped out, the sinus disinfected, and the jugular vein tied. The steps of the operation are: 1. ligating the jugular at the neck, below the thrombus, if possible; 2. opening the mastoid and tympanic cavity; 3. expose, incise, and disinfect the sinus; 4. irrigate the bone cavity and the upper end of the jugular; 5. plug the sinus with iodoform gauze.

The symptoms of *cerebral and cerebellar abscess* are duly dwelt upon, yet the difficulty of diagnosis and localization is not concealed. The symptoms are classified and enumerated in the usual way, as 1. symptoms due to the suppuration; 2. those due to increase of intracranial pressure, and 3. symptoms of localization. The etiology and the totality of the disease-picture must lead to the diagnosis more than the presence of special symptoms. Of the semeiology of *cerebellar abscess* the authors say that it is not very definite either. The only symptoms of some value are: occipital headache, vomiting, drunken reeling, dizziness, and stiffness of the nape of the neck. As those symptoms are almost never combined in a given case, the diagnosis remains difficult. They are more dwelt upon in chapter iv., p. 93. Like every operator in this new field, A. Broca confesses mistakes in diagnosis which only the autopsy cleared up. His excuse is that he was mistaken in good company. He emphasizes that in many cases several lesions are present, and therefore he is a warm advocate of the so-called **mastoid method** of operation, which was first described and recommended by WHEELER, at the Brit. Med. Ass., 1887 (*Lancet*, London, 1887, vol. ii., p. 317). This method, which has of late been repeatedly endorsed—among others by U. Pritchard in these ARCHIVES, vol. xxiii., p. 24, 1894—consists in first opening and cleansing the mastoid and the tympanum, and then, if advisable according to the conditions found, the wound should be extended backward into the posterior cranial fossa, where epidural abscess, thrombosis of the lateral sinus, and cere-

bellar abscess may be found ; or the extension of the wound is carried upward and forward, from the aditus ad antrum up into the middle cranial fossa, where epidural and temporo-sphenoidal abscess can be reached and dealt with. The other methods are discussed in detail, and numerous instructive cases, from many authors, are related either in full or more or less abridged. The indications, differential diagnosis, and operative technique are in many places repetitions of what has been most carefully described in the general part in chapters iii. to vi., but the presentation is more specialized, and nowhere tiresome.

The remaining 220 pages of the book are devoted to the description of intracranial tumors, diverse cerebral lesions (hemorrhage, softening, meningitis, abscess, and paralysis from various causes), hychrocephalos, microcephalos, and idiocy, functional troubles (epilepsy, psychoses, obstinate headache), and encephal-ocele.

The whole work gives a full presentation of what brain surgery can legitimately claim, and upon what it has experimentally encroached. It is attractively written, never heavy, not particularly dogmatical, but with an earnest purpose to impart useful information. Literature is most extensively and impartially used ; we were astonished to see so many American authors cited, especially in the last third of the book.

We have read this opportune work with delight and great profit, and feel assured that it will be welcome to all that take an interest in the newest development of this branch of surgery, in particular to otologists.

H. K.

MISCELLANEOUS NOTES.

APPOINTMENTS.

SANTI, P.R.W. ; de F.R.C.S., has been Appointed Assistant Surgeon and Aural Surgeon to the Westminster Hospital, London.

DALE, FREDERIC, M.D., CANTAB., F.R.C.S. Oxon, has been appointed Honorary Ophthalmic and Aural Surgeon to the Scarborough Hospital and Dispensary.

The extraordinary Professor Dr. H. SCHWARTZE, of Halle, has received the title of honorary professor.

Dr. JANSEN, of Berlin, and Dr. GRUNERT, of Halle, have been appointed lecturers (Privat-Dozenten).

Dr. V. MAZZI, of Pisa, Dr. G. MASSINI, of Genoa, and Dr. G. GRADENIGO, of Turin, have been appointed extraordinary professors.

NOTE.

The Lord Bishop of Derry, on April 28th, opened a Hospital for diseases of the Eye, Ear, and Throat, in Londonderry, containing twelve beds. It will fill a want not only in Londonderry, but in the Northwest portions of Ireland.

OBITUARY.

Dr. SAMUEL SEXTON, of New York, well known as an aural practitioner and writer, died in July, 1896.

Contents of the newest number of the *Zeitsch. f. Ohr.*
Vol. xxviii., No. 4.

O. KÖRNER. Suppuration of the ear and mastoid in diabetics.

A. BULLING. Otitismedia in influenza.

ROEPKE. Case of otitic pyæmia; abscess, and thrombosis of lateral sinus. Operation. Recovery.

Translation from the English edition of papers by DENNIS, RICHARDSON, and THOS. BARR.

Reports on Progress for 3d and 4th quarters of 1896 (translated in our previous issues).

EDITORIAL NOTICE.

We beg authors to send American papers to be reviewed in the *Report on the Progress of Otology* to Dr. GORHAM BACON, 63 West 54th Street, New York, British papers to ARTHUR H. CHEATLE, F.R.C.S., Esq., 117 Harley St., London, W., books and monographs in book-form to the editors.

ARCHIVES OF OTOLOGY.

ON GENERAL PYÆMIC INFECTION FOLLOWING AURAL SUPPURATION.

By DR. O. BRIEGER,

PHYSICIAN TO THE ALLERHEILIGEN HOSPITAL IN Breslau.

Translated by Dr. A. B. KIBBE, Seattle, Washington.

I.—PYÆMIA WITHOUT SINUS-PHLEBITIS.

OUR views on the relation of otogenous pyæmia to sinus-phlebitis have become essentially broadened in recent times. While up to the last four years the onset of the symptoms of pyæmia was sufficient for the diagnosis of sinus-phlebitis, it is now definitely established that the complex of symptoms of pyæmia may be associated with aural suppuration without the agency of thrombosis of a cerebral sinus. Along with the relatively frequent form of pyæmia, which, like acute infectious osteo-myelitis, is caused by osteo-phlebitis, a third rare form of septico-pyæmic infection has been described by A. Fraenkel and designated as a *dermato-myositis*. Under the same title, Unverricht had described a peculiar complex of symptoms, the characteristic evidences of which he took to be multiple myositides and peculiar changes in the overlying skin. In his cases the autopsy revealed a peculiar jelly-like œdema of the affected muscle which was permeated with hemorrhages, imbedded in a highly œdematous perimysium, and covered with œdematous and often erysipelatoid-colored skin, but never showed any tendency to suppuration. This absence of actual suppuration distinguishes this form of myositis from the abscesses of muscles which occur with relative frequency

in the course of pyæmia. In one case occurring in my hospital practice, the characteristic symptoms of dermato-myositis were decisive only a few days before death, though the actual beginning was clearly some time earlier.

G. B., aged, thirty-nine, chronic suppuration of middle ear, large kidney-shaped perforation. Fistula above short process. Markedly anæmic, complains of weakness which has existed for some time. Frequent chills. After twelve days' treatment, hammer was excised without narcosis. Entered hospital eight days after operation on account of weakness and elevation of temperature to 39.2° C. The left forearm, particularly on the flexor side, showed marked œdema; slightly less on the right arm and forearm. On the left forearm diffuse reddish discoloration of the skin. Slight œdema of both thighs near the knees. Temperature persistently high, once 41.5° C., irregularly remittent without typical rigors. His condition became gradually worse, and death took place fourteen days after the excision of the hammer.

Autopsy.—Small coagulum in the left lateral sinus. Left drum-head totally wanting. Granulations springing from the Rivinian segment. Mucosa of middle ear otherwise pale and covered with a thin layer of non-fœtid pus. Organ of hearing otherwise without change. On the flexor surface of both forearms extensive œdematous infiltration of the skin and subcutaneous tissue; in the latter numerous hemorrhages, the muscles infiltrated and strewn with small hemorrhages. Thin brownish-yellow fluid exudes on pressure, but no pus. A similar condition was found on the extensor surface of both thighs.

Clinically, this case corresponds throughout with Unverricht's description of the disease, anatomically also it corresponds in the main. Particular explanation, however, may be required of the presence of a coagulum in the left lateral sinus. This I took to be a post-mortem clot.

Muscle metastases in otogenous pyæmia are in themselves nothing rare, but in all cases of this nature abscess formation takes place rapidly. Here, in spite of the long standing of the process, nothing of a purulent nature was to be discovered. The peculiar behavior of the metastases in muscles is the point which principally distinguishes this form from the common variety of otogenous pyæmia. In addition to the

changes in the skin, it is the normal condition of the cerebral vessels which forms the basis of the classification. It is apparent, therefore, that the integrity of the sinuses must be established by an examination of all the vessels.

Another form of otogenous infection which in its symptoms stands in close relation to the pyæmia induced by sinus-phlebitis, was first taught us more exactly by Koerner. As in acute infectious osteo-myelitis, pyæmia may arise mainly in acute inflammatory processes by a phlebitis of the osseous vessels. That sinus-phlebitis also may take its origin from a similar cause was pointed out by Schwartze¹ in an early work. Koerner, however, ascribes to such osteo-phlebitis the power of producing pyæmia *without* involvement of the lateral sinus.

Evidence of the presence of osteo-phlebitic pyæmia is, in individual cases, very difficult to detect, and only sufficient to indicate a probability of its existence. Koerner lays special stress on the behavior of metastases, which in osteo-phlebitic pyæmia are rarely localized in the lungs, while arterial emboli are observed much more frequently than in sinus-phlebitis. Hessler's² recent article substantiates Koerner's statement that a large group of cases of otogenous pyæmia which differ clinically by the absence of all local symptoms of sinus-thrombosis, by the greater benignity of the entire disease picture, and by the unity of pulmonary metastases with relatively frequent metastatic joint and muscle involvement, indicate a special classification. This classification is not impaired by the occasional occurrence of pulmonary abscesses, which I have observed in one instance:

A. G., aged eight weeks. Previous history not obtainable. Infant greatly emaciated. Temperature normal. Right otitis media purulenta chronica. Death four days after entering hospital.

Autopsy.—Broncho-pneumonia with small sub-pleural abscesses. The lungs showed a number of grayish-red nodules, some of which were marked by a suppurative inflammation of the over-

¹ *Archiv für Ohrenheilkunde*, Bd. vi., S. 220.

² *Archiv für Ohrenheilkunde*, Bd. xxxviii.

lying pleura. The centre of each was purulent and surrounded by a granular, grayish-red pneumonic zone.

Cerebral sinuses healthy. Brain presented no noteworthy change.

Wide perforation of right drumhead. Tympanic mucosa—covered with a thin layer of slightly foetid secretion—diffusely swollen and extending above the edge of the perforation in the form of pale-red granulations.

Sinus-phlebitis may here be excluded with certainty. The pulmonary abscesses must be considered as metastatic embolic foci, although plugging of the branches of the pulmonary artery could not be demonstrated, at least macroscopically. The only source to be found for these metastases was the suppuration in the mucosa of the right tympanum. Here we see a pyæmia not clinically recognizable develop without any justification for the assumption of an osteophlebitic process, apparently through the direct absorption of exciting substances from the tympanum into the blood-paths, and finding its expression in the formation of numerous embolic foci in the lungs.

The operative opening of the mastoid cavities in the absence of marked local indications, has its considerations. This is not the place to give my own experiences in early operations, but as not unimportant for the question before us, I may bring forward the fact that in operations undertaken during the early days of the disease the subjective mastoid symptoms were lessened, but the general condition was not only repeatedly uninfluenced, but increased fever and chills were observed. The local course was also more unfavorable and more tedious than usual in cases operated upon before the inflammation had reached its height and pus was demonstrable.

II.—THROMBO-PHLEBITIS OF THE LATERAL SINUS.

While the therapy of sinus-phlebitis has produced unexpected results, but little advance has been made in its diagnosis within the past five years in spite of the large number of casuistic communications. The most weighty indication of

its existence, according to our present knowledge, has been the general evidence of pyæmia, the onset of which, as a rule, first calls our attention to its development. Knowing as we now do that still another form of pyæmia without sinus phlebitis may follow middle-ear inflammation, the conclusions which we may draw from it have become more questionable and uncertain.

The diagnostic importance of the characteristic temperature curve in pyæmia, with its remissions to and below normal, and the rapid rise, usually accompanied by a chill, is unquestioned. What I have said above is directed against the diagnostic value of single rigors as they may occur in middle-ear inflammation without pyæmia. The temperature curve in sinus-phlebitis does not always follow the pyæmic type. According to my observation it is frequently so modified by co-existing local complications, that the characteristic deep remissions were less frequent or wanting. "The degree of hyperthermia does not always express, and rarely exactly, the intensity of the infection." Variations in temperature of 4° C. and over within twenty-four hours I have repeatedly observed, but never more frequently than once during the period, the cessation of fever.

A typical pyæmic temperature curve also may not prevent, in the absence of frequent rigors, a confusion with typhoid in the stage of marked variation in temperature. This is often the case in septico-pyæmic processes, as for instance in acute infectious osteo-myelitis, which has frequently been confounded with typhoid. Such an error once came under my observation. Naturally errors the reverse of this are possible in that occasionally typhoid may be confused with sinus-phlebitis owing to the simultaneous existence of aural suppuration.

Confusion with malaria and tuberculosis is also possible, as in a case of tuberculosis of the middle ear with diabetes coming under my notice, pyæmic symptoms were so developed that for two weeks a chill occurred every day at the same time, followed by an elevation of temperature lasting a few hours. Other symptoms of pyæmia were wanting even for some time after.

An important aid in the differential diagnosis between typhoid and malaria and pyæmia is the examination of the blood. Malaria is certain when the plasmodium can be demonstrated in microscopic preparations. Whether pyæmia or typhoid exist can only be decided by the demonstration of the typhoid bacillus.

Passow notes in his short case-history that prior to the operation *peptone* (by Salkowski's method) was found in the urine; after the emptying of the abscess and the extrusion of the necrotic posterior sinus wall, it was absent. *The diagnostic value* of the demonstration of peptone in endocranial complications, a more thorough discussion of which I reserve for later treatment, is restricted principally to the diagnosis of purulent meningitis and of brain abscess.

Among the most important local symptoms of sinus-phlebitis changes in the background of the eye are to be reckoned. But they are nothing specifically peculiar to this disease, not mechanically caused by it, but common to all other endo-cranial consequences of middle-ear sup-puration and more frequently found with them than in pure sinus-phlebitis.

Jansen¹ has observed papillitis in 31 per cent. of his cases. In 14 cases I have noted changes in the background of the eye varying from simple hyperæmia to the complete picture of choked disc seven times. Of this number three occurred in isolated thrombosis of the sinus cavernosus. Seven times the findings were negative. In but two cases with positive findings did extra-dural abscesses exist. In fact I have almost as a rule failed to find changes in the ophthalmoscopic picture in these cases in spite of a large amount of material.

The local symptoms which stand in relation to the emissaries, the œdema at the posterior border of the mastoid process (Griesinger) in the occipital and cervical regions are not the consequences of stasis in a venous area flowing into the sinus. In this they are principally to be distinguished from the swelling in the region of the brow and eyelids met with in thrombosis of the cavernous sinus. The difference is to be found in the anatomical

¹ *Zeitschrift f. Heilkunde*, 1893.

relations. While the blood stream in the emissaries flows *away* from the lateral sinus, the ophthalmic vein empties *into* the cavernous sinus. This indicates that in sinus-thrombosis the phlebitis and not the thrombosis is the primary affection. In our assumption of the genesis of sinus-thrombosis many points are not clear. Cases in which the thrombosis arises by an extension of the osteo-phlebitic process in the veins of the tympanum or dura, in the veins of the aquæductus vestibuli, or the internal auditory vein (sinus petrosus inferior or bulbus jugularis) are easily understood. The most frequent manner of development of sinus-thrombosis is by the direct extension of inflammatory processes in its wall.

The swelling between the mastoid process and cervical vertebræ is a consequence of the phlebitis, not a mechanical sequel of the thrombosis. These œdemas, possibly of toxic origin, are also so diffuse that it would be difficult, if not impossible, to place them according to their location in relation to any certain section of the thrombosed sinus. Typical development of Griesinger's symptoms—circumscribed hard infiltration extending backward from the posterior border of the mastoid process—I observed with normal sinus in a case of tuberculosis of the temporal bone originating from an isolated pus collection in a bone cell lying far back.

But all these œdemas, particularly infiltration of the muscles of the neck, occur in uncomplicated suppuration of the mastoid process, especially in the so-called Bezold mastoiditis, so frequently and in a form so completely corresponding with that swelling characteristic of sinus-phlebitis that only a qualified diagnostic value is to be attributed to them.

Extension of the thrombosis to the jugular vein is occasionally directly perceptible. In the side of the neck along the course of the large vessels a dense cord, painful upon pressure, may be felt, but this finding also, which is most often found noted in case-histories, is only to be taken with great caution. Schwartz has observed sensitiveness of the vein without any co-existing inflammatory change; apparently communicated to the vein by the adjacent lymph

plexus. Gravitation of pus may also produce a small infiltration, and simulate thrombosis of the jugular. In connection with this cord-formation along the jugular stands the pain in movements of the head in all directions, and the frequent restriction of movement, which not rarely finds its expression in the development of a *caput obstipum*. Usually the head is inclined toward the affected side.

At the end of our observations on the symptoms of sinus-thrombosis we arrive at the same results for diagnosis as have those who have recently written upon the subject. The disturbances which have been referred to as a direct local consequence of thrombo-phlebitis of the lateral sinus are not sufficiently indicative. General evidences of pyæmia are not alone characteristic of pyæmia following sinus-phlebitis. In many forms of mastoid suppuration, particularly in perforation through the lower wall of the process, we are apt to observe those symptoms of general infection which we are accustomed to look upon as pyæmic, in addition to the œdema which simulates that arising from thrombosis of the emissaries.

R. G., thirty-eight years of age. Was attacked a week prior with severe pains in right ear, initial chill the second day of the disease.

Present Condition.—Prolapse of the posterior and upper wall of the meatus, profuse discharge increased by pressure upon the mastoid, moderate swelling over the latter, which is sensitive to pressure; œdema from the posterior border of the same extending backwards almost to the median line. Anterior to the tip of the mastoid a circumscribed swelling extending downwards along the anterior border of the sterno-cleido-mastoid muscle in the form of a hard, painful cord.

Operation.—Beneath the thin cortex a large abscess cavity existed, including the antrum; perforation on the under surface; communication with a gravitation abscess by a broad fistula opening into the inferior wall of the meatus. At the bottom of the abscess in the mastoid lies the slightly discolored pulsating wall of the sinus covered with granulations. Repeated puncture of the sinus shows unchanged blood. Discharged cured two months later.

The local symptoms of extra-dural abscesses are usually so similar to those of sinus-thrombosis that in cases in which the typical pyæmic symptoms are wanting sinus-thrombosis may be easily surmised. When there exists only a collection of pus on the anterior surface of the sinus, characteristic pathognomonic evidences are not usually produced by these abscesses. Only where cerebral symptoms exist as they are observed under certain circumstances in extradural abscesses, there occurred to me in a few cases such remarkably rapid changes in the symptoms, such an inconsistency of these local as well as diffused cerebral symptoms as we scarcely see in meningitis, the symptoms in which often quickly change. In this particular the extra-dural abscesses are to be distinguished from the cerebral abscesses which accompany sinus-phlebitis in that evidences of pyæmic infection are wanting.

From the inspection of the bared sinus much was expected as to the character of its contents. As to the importance of the demonstration of gangrenous spots on the sinus wall or from fistulæ leading into its interior there exists no doubt. Judging from discoloration or from changing resistance of the sinus wall leaves much to individual measurement, and not seldom leads, according to my experience, to conclusions which by further examination of the interior of the sinus prove false. The direct palpation of the thrombus through the wall of the sinus is useless and, as a rule, without result, as in the cases with which we are dealing there is usually no longer a solid thrombus following the lumen of the sinus.

Particular weight has been laid by many authors on the action of the movements of respiration and cardiac pulsations on the sinus. The demonstration of respiratory movements succeeds so rarely on the normal sinus that from its absence it will be impossible to draw conclusions of any value, for diagnosis. It is otherwise with the pulsatory movements of the sinus itself. Berthold¹ was the first to describe the venous pulse in the cerebral vessels. With this venous pulse the pulsatory movements of the sinus

¹ *Centralbl. f. d. Med. Wissensch.*, 1879, No. 43.

have, as a rule, nothing to do. They are very frequently nothing but the expression of diffuse cerebral pulsations, as one can demonstrate easily in individual cases by laying free the dura. If it is thus produced, and the pulsatory movements of the entire contents of the cranium are communicated to the sinus, it can then make no difference whether it is thrombosed or filled with flowing blood.

Occasionally the external wall of the sinus in extradural abscesses with sinus-phlebitis is not, as it is usually described, very thin and resistant, but is covered with granulations, or more rarely with a thick pad of scarcely detachable pachymeningitic exudate. Under these circumstances in laying bare the dura severe hemorrhage occasionally occurs, the source of which one is liable to attribute to the sinus. The hemorrhage from greatly dilated dural veins or vessels communicating with them (*venæ diploicæ*, Jansen¹) is occasionally quite as abundant as from the sinus itself. Such hemorrhage, however, is to be distinguished from bleeding from the sinus in that it ceases very quickly of its own accord. If the separation of the dura is interrupted, the contents of the cranium press the bleeding venous trunks against the bony wall of the opening, and thus firmly occlude them. The hemorrhage from the *venæ diploicæ* is controlled very quickly by pressure, while in hemorrhage from the sinus the wound must be compressed by a tampon until union of its edges has taken place. Occasionally, difficulty to recognize the sinus from the thickened dura overlying it occurs, particularly in manipulation undertaken for the purpose of examining the contents of the sinus. For this purpose we may choose between two procedures—puncture and aspiration by aid of a syringe, and incision of the sinus. The first proviso for a choice of one of these methods of examination is its lack of danger. At the first glance it might appear as though the exploratory puncture should have the preference in this connection. The experiences on this question in accidental opening of the sinus during the chiselling of the mastoid process render more or less certain the lack of danger of the procedure. Personally

¹ *Arch. f. Ohrenheilk.*, Bd. xxxi., S. 167.

in not a small number of intentional or accidental openings of the sinus I have never seen any immediate ill effects. If it is certain that incised wounds in the sinus usually unite without any alteration in the column of blood flowing through it, any objection, therefore, is wanting which holds that exploratory incision is more dangerous than aspiration. In addition, the blood stream flowing from the normal sinus through the incision would be a protection against the danger of entrance of micro-organisms which could not be so certainly prevented by exploratory puncture. The most essential disadvantage of incision is that, as a rule, the operation must be completed at once, while the slight hemorrhage following the exploratory puncture is stopped by compression, but as exploration of the sinus usually closes the operation this objection can hardly be considered. I cannot, however, in general recommend exploratory incision in place of puncture. As a rule, I puncture first, and if the result is not decisive, conclude by making an exploratory incision. Positive result, that is, the demonstration of pus, is naturally conclusive. In the presence of a firm occlusive plug a negative result would only in that sense be expected that aspiration was impossible owing to the firm nature of the thrombus. *The aspiration of fluid blood from the sinus does not exclude the presence of a thrombus.* The disintegration of the thrombus may have made the passage for the blood stream so free that at the moment of puncture only fluid blood was encountered, and the remains of the thrombus, still clinging to the walls, remain unrecognized. Positive findings, provided naturally that they are composed of disorganized purulent thrombus-masses, and not of material the composition of which is at least doubtful, are absolutely indicative.

Our views on the prognosis of sinus-phlebitis have become essentially broadened under the influence of therapeutic progress. Schwartze has spoken of death as the usual result in sinus-phlebitis, but at the same time has stated that its prognosis is not so absolutely unfavorable as in brain abscess and meningitis. The prospects of a cure in sinus-phlebitis to-day, although they have become perceptibly better for

brain abscess, and even arachnitis cannot be spoken of as absolutely hopeless, are still relatively the most favorable of these three forms of endo-cranial diseases, the consequences of middle-ear suppuration. The prognosis of individual cases depends essentially upon the stage in which treatment is begun. If metastatic foci have not restricted the function of vital organs, it is not absolutely unfavorable. Whether the cure, which in a few exceptional cases occurred spontaneously by obliteration of the sinus, remains permanent, depends on the cure of the fundamental disease, the discharge from the ear. If this is not possible, the opportunity then remains for the origin of thrombo-phlebitis in those blood-vessels which have not been obliterated, as Jansen in fact demonstrated in a patient who, within the space of eight years, was twice attacked with symptoms of sinus-phlebitis and pyæmia. The radical cure of the primary disease localized in the spaces of the middle ear is therefore the first proviso for the persistence of a cure of sinus-phlebitis. The therapy of sinus-phlebitis has made the most surprising progress within the past few years. Even in Pitha-Billroth's *Handbook* Heineke wrote, "The treatment of sinus-thrombosis is out of the question." To-day, literature furnishes so large a number of positive cures that we must conclude that the difficulty in treatment in sinus-phlebitis, as in brain abscess, lies not in the domain of the operation, but almost entirely in that of diagnosis. On this account it is practically correct in doubtful cases to adopt Barker's method of operative diagnosis, and with well-founded suspicion to bare the sinus. In chiselling the mastoid, which in certain cases has resulted in a cure of sinus-phlebitis by emptying the primary purulent deposit, we cease only when the sinus is reached, and if exploration reveals no ground for a suspicion of thrombosis the case may be treated expectantly.

Chiselling of the mastoid is certainly to a degree dangerous in sinus-phlebitis through the jarring communicated to the contents of the skull. If it is possible to produce a transient or even persisting deafness due to commotion of the labyrinth by chiselling sclerosed bone, we must recognize the possibility from the same cause of loosening thrombi

attached to the sinus wall, and thus permitting their entrance into the circulation. Literature contains numerous observations in which the displacement of thrombi was immediately associated with injuries to the head, particularly in cases of operative baring of the sinus.

In spite of this, however, I hold firmly to the opinion to which A. Brieger¹ has given expression, that this main objection does not justify the abandonment of a method which, from the standpoint of simplicity and conformity to the purpose, presents the greatest advantage and which up to the present time is practically indispensable.

The evacuation of extradural abscesses has, like the simple opening of the mastoid, led to a cure in many cases. The following is a case coming under my observation :

A. M., aged twenty-six, discharge from right ear of several years' duration. Severe headache for the past two weeks, first chill occurred four days ago. High degree of œdema between mastoid and back of neck ; *along the anterior border of the sterno-cleido-mastoid hard painful cord ; optic neuritis.* Temperature, 40.1° C. Operation the day following admission. Cortex thin ; abscess cavity filled with cholesteatomatous masses and communicating with a large perisinuous collection of pus by a small fistula. Sinus pulsating. Defect in posterior wall of meatus. Temperature curve marked by remissions to 39°, 38°, and 37.4° C., and rapid rises to 39° and 40° C. Chills frequent, the last occurring on the thirteenth day after operation. Gradual decline of the optic neuritis. Pulse remained permanently above 100. Patient discharged cured two months later.

As far as it is possible to diagnose sinus-phlebitis clinically, it was justified in this case.

The possibility of a cure of sinus-thrombosis by clearing out the primary pus collection and evacuating the pus which bathes the sinus, seems to me from this experience to be undoubted. The statement of Bergmann in his work on the surgical treatment of brain disease, that thrombosis of the lateral sinus is freed from its dangerous character by removal of the pus in contact with its walls, is completely sub-

¹ *Archiv f. Ohrenheilk.*, Bd. xxxv., S. 89.

stantiated by my experience. If the production of fresh excitants ceases, the organization of the thrombosis can proceed unhindered, provided no extensive disintegration has occurred. In this fact lies an earnest warning to refrain from too energetic procedures without unquestioned indications.

When thrombosis has been demonstrated, the manipulations consist of wide opening by excision of the wall and evacuation of the contents of the sinus. The danger of entrance of air into the vessels of the brain, formerly so greatly feared, does not seem to exist in perceptible degree. The rarity of inspiration of air is attributed usually to the rigidity and immobility of the vessels. The essential fact is, however, that in the cerebral vessels a positive pressure exists, not as in the jugular vein a weak negative.

If complete disintegration of the thrombus exists with firm central occlusion, and that portion which is opened is filled with pus and thrombus-masses, the evacuation of the pus by incision may lead to a cure without anything further. More difficult to explain are the favorable effects in cases with the clinical symptoms of sinus-phlebitis in which the operation has not disclosed a thrombus. Here is a case in point :

D. L., aged fifty-two. Attacked with influenza six weeks prior to admission. Pain in right ear commenced some days later. No discharge. Repeated chills. Four days before admission swelling in vicinity of right ear. Temperature normal ; fundus oculi normal. Diffuse œdema of tissues back of ear extending to neck, also in front of ear. Drumhead bulging and reddish-yellow in color. Prolapse of posterior and upper wall of meatus. Total facial paralysis of right side.

After removal of the almost sclerotic cortex a cavity was encountered, filled with tenacious yellow pus, communicating posteriorly with a widespread perisinuous pus collection. In addition a communication existed with a gravitation abscess at the lower anterior border of the mastoid process. Fistulous perforation at the incisura.

Pressure on the swelling back of the mastoid evacuated more pus from the abscess surrounding the sinus. The entire descend-

ing crus of the sinus was bared and its wall found covered with granulations. On the twenty-second day a chill occurred which was repeated the following day. Rapid rise in temperature to 40° C.

Sinus again exposed. Pulsation plainly visible. Small amount of fluid blood removed by aspiration. Incision also gave exit to but little blood. On this account the descending limb of the sinus was split almost in its entire length. Copious hemorrhage, pulsating in character, necessitated tamponing. Chill in the evening, with rapid rise of temperature to 39.6° C. Progressive improvement from this time on, ending in recovery. Bacteriological examination of blood from median vein as well as from sinus resulted negatively.

Here the diagnosis of sinus-phlebitis was not rendered certain. It was, however, made upon a better foundation than many others which have been described as sinus-phlebitis solely through the onset of a pyæmic form of fever. The coincidence of the subsiding of the fever with the opening of the sinus may naturally be considered as accidental, but the assumption of a causal connection between both processes appears to me to be more plausible than that the chills should have come to an end upon the day of the operation.

Just what course should be taken in simple thrombosis after opening of the sinus in cases where purulent softening of the thrombus is not apparent at the point of incision, is at the present time undecided. Hessler opposes in such cases the opening of the sinus in order to prevent a possibility of infection if puncture has shown simple thrombosis to exist. If, after opening the sinus, one is certain of the presence of a solid obstructing thrombus, the removal of the mass may be deferred and its possible organization waited for. It is impossible to lay down general principles for the procedures which one may adopt in a case of simple thrombosis. To adopt an expectant plan in general until such time as a return of pyæmic symptoms forces one to clean out the sinus, would be a mistake.

The method of exposing the sinus has of late been so frequently treated in an exhaustive manner that I may omit its

description. The sinus must be sought for in the same direction in which the pus from the cavity of the mastoid has proceeded. All the measurements and statements relative to the location of the sinus or its individual segments to different points on the external surface of the cranium, as Koerner has already explained, are unreliable and useless.

Injuries of the inferior vertical semicircular canal may produce no symptoms, or these may be concealed by the severity of the general symptoms. In one of my cases severe giddiness occurred, which came on with the slightest lifting of the head from the horizontal position, and particularly in turning the head in the direction of the affected ear. Three days later the condition was greatly improved.

The results in cases operated upon by me are as follows: The total number of cases observed was fourteen; of these six were observed at a time when operative treatment was not generally approved of. In two, sinus-phlebitis was not recognized during life. All of the six, in spite of chiselling the mastoid, ended fatally. In the remaining eight which were operated upon, three were treated by the evacuation of extra-dural abscesses, of which two were cured; one died from pyæmia and meningitis. Three cases were treated by measures directed to the sinus. One was cured, two died from pyæmia.

Concerning the changes which take place in the open sinus after clearing out the thrombus-masses, and the manner of healing in sinus-phlebitis treated by operation, we have, up to the present time, no exact description. As a rule, cases operated upon have not remained under observation long enough after operation, but have died before changes in the sinus could have become organized. By the ligation of the jugular the most important action expected is the prevention of the transportation of thrombus particles to the heart. But granted that the absolute occlusion of the principal path to the heart may not prevent the carrying of emboli on account of the number of collateral vessels, Forsselles¹ is right in his statement that it is at all events better to have one rather than two paths for infection. In describ-

¹ *Lateralsinus-Thrombose*, S. 36.

ing the difficulties which the slight power of distension of the emissary veins affords for the development of collateral circulation, Zaufal¹ has pointed out the fact that in suddenly occluding the path by thrombosing the sinus the extra amount of blood is driven less into the emissaries than into the meningeal and cerebral veins. A similar effect seemed to have been produced in a previously reported case by ligation of the jugular, in that, with the blood, pyogenic substances or particles of the thrombus were pressed into the veins upon the surface of the brain, so that these appeared like strands of pus. In addition, the thrombophlebitis was transferred through the emissaries to almost all the cerebral sinuses, and finally to the jugular of the opposite side. In addition, extensive pulmonary metastases and multiple pyæmic cerebral abscesses were found. I cannot blind myself to the view that the occlusion of the jugular, corresponding to the thrombosed lateral sinus, did not only fail to prevent the exit of particles of the thrombus, but really favored the unusually widespread thrombo-phlebitis, which apparently took place in all possible directions.

It is certainly conceivable that this occlusion of the path of exit might possibly have had fewer questionable results if the thrombo-phlebitis had been reached at the first operation in its entire extent, and the danger of a backward flow in the adjacent venous area diminished by wide opening or excision of the jugular cord. *Ligation of the jugular is then only unquestionably justified when it is locally indicated*, that is, if a thrombo-phlebitis of the jugular bulb or of the vein itself exists, but then less as a means of cutting off the phlebitic focus from the blood stream than as the first act of therapeutic measures directed against the thrombosis.

In opposition to Koerner I do not believe ligation of the jugular in sinus-phlebitis to be devoid of danger. The danger of emboli in such a sudden and rapid occlusion of the vein, the points of origin of which may still in great part be free, is greater than in the gradual, slowly-developing occlusion which arises by thrombosis or consecutive obliteration.

¹ *Wiener med. Wochenschr.*, 1886, No. 41.

tion. The centripetal flow at the point of ligation undergoes reversal of its stream, whereby naturally any thrombi clinging to the walls are torn loose and may be carried in a centrifugal direction. In this way we may explain the origin of discontinuous thrombi, which are separated from one another by a normal venous area, and above all the genesis of multiple metastatic cerebral abscesses.

Of first importance, however, is the danger that ligation of the jugular may produce thrombosis of the blood columns in that venous area excluded by ligature and sinus-thrombosis. Stasis of the mass of blood within a vessel is not in itself sufficient to cause coagulation. A proviso for its origin is the presence of an alteration of the vessel wall. How in slight and imperceptible changes in the vessel wall the blood column may coagulate over a wide expanse is shown in a case published by Wendt,¹ in which compression of the jugular by a glandular tumor in the neck caused almost complete thrombosis of the corresponding lateral sinus. An alteration of the vessel wall may be sufficient for the thrombosing of the stagnant mass of blood, which would be immaterial for blood travelling at its normal rate (Eberth und Schimmelbusch).²

In circulating blood its bactericidal power may exert itself by destruction of, or by restraining the development of pyogenic organisms which have gained access to it. A thrombus, on the contrary, is rapidly attacked by micro-organisms, for which it furnishes favorable conditions for growth, the consequences of which, under certain circumstances, may be a progressive thrombo-phlebitis. This assumption has been substantiated by the observations of Lane, Deansley,³ and Langenbuch.⁴ Pyæmia and sinus-phlebitis ending fatally were the results of operations on the normal sinus and jugular. Langenbuch expressed the opinion that in his case a sinus-thrombosis first formed after the operation, but thanks to the ligation of the jugular no large metastases took place. In this case, which

¹ *Arch. d. Heilk.*, Bd. xi., S. 593.

² *Fortschr. der Medicin*, 1886, No. 4.

³ *British Med. Journ.*, 1895, p. 803.

⁴ *Berl. klin. Wochenschr.*, 1895.

ended in recovery, both the sinus and the jugular were found normal at the operation, but in spite of ligation of the jugular, metastases formed a number of weeks later which were wanting prior to that time. It is difficult to understand how in this form of pyæmia, in which a direct spread of micro-organisms in the circulation without the assistance of large embolizing masses takes place, ligation of the jugular could have been adopted, when we are aware of the large number of venous paths in the temporal bone which in themselves render this procedure useless. With only a suspicion of sinus-phlebitis, to begin with ligation of the jugular is an error. In my opinion it is more proper to commence at that point where the disease process is supposed to exist, instead of adopting a prophylactic operation against a danger which possibly does not exist.

The possibility of direct precipitation into the blood-stream of portions of a sinus-thrombus by manipulation of the sinus itself, without previous ligation of the jugular, appears, as Koerner shows, to be deduced theoretically rather than to exist practically. It appears more probable that the sinus is usually closed towards the heart by a sufficiently solid thrombus.

If it is impossible to define the limits of the thrombus when exposed as much as possible, or if its decomposition extends into the horizontal portion of the sinus so that its occlusion by a solid plug is but slightly probable, or if the course after the operation permits the assumption of the loosening of this occlusion and the centripetal extension of the thrombus, ligation of the jugular is justified. More than that, it is necessary if the thrombosis has already extended into the jugular itself.

Ligation of the jugular, therefore, must be locally indicated. It should not be undertaken solely as a prophylactic measure directed against general pyæmic infections. For the purpose of cutting off the thrombosis from the circulation, ligation of the jugular does not suffice. If it is desired to practically isolate the thrombosed area (which on account of the impossibility of excluding all its connections is out of the question), it is necessary to occlude it at both of the

principal points of its origin and to ligate not only the jugular but the torcular as well as was first proposed by Horsley. Ducellier speaks of Chipault's operation as one which appears practical but which has never been tried: the first act of which is the double ligature of the internal jugular with section of the vein and fixation of its peripheral end in the wound; the second act, the ligature of the transverse sinus close to the torcular and its occlusion; and lastly, the opening of the sinus, with resection of the wound and sinus and jugular drainage. Statistics appear to speak for the utility of ligation of the jugular. The percentage of cures in combined opening of the sinus and ligature of the vein, according to Koerner, exceeds those of exclusive operations on the sinus perceptibly. Statistics, however, on this question are not decisive in themselves. For one thing, as we have previously stated, cases are included in which the presence of sinus-thrombosis was not completely demonstrated. In addition, the various cases differ so much and were operated upon at such varying stages of the disease, and the cure in exceptional instances was so largely dependent upon other factors than the operation itself, that the fact that the number of cures from ligature of the jugular being the greater does not alone speak for the greater worth of the combined method. Statistics based upon a greater amount of unquestionable material will perhaps show an increased percentage of relative cures. On this account it appears to me that at the present stage of the question the standpoint is not unjustified that the statistics derived from the individual results obtained by observers having access to a relatively great amount of material is worthy of more attention than that derived from an accumulation of the published results of various authors. Schwartze, Jansen, and Macewen, however, have thrown aside ligature of the jugular in sinus-phlebitis, basing their actions on observations derived from the large amount of material at their command.

Our case, in which it was difficult even at the autopsy to find the vein and to follow its course, points to the technical difficulties which may lie in the way of its ligation. One cannot be guided by the evidence of swollen glands

which usually may be expected to lie at the outer side of the sheath and above the jugular. In the case already referred to, following the swollen glands in the area selected for ligation would have led us directly to the carotid. In cases in which one has a choice in the matter, in those in which the vein is still free from thrombosis it is better to follow the direction of Von Bergmann and tie the internal jugular above the point of entrance of the facial. A proviso for carrying out this procedure is naturally the direct emptying of the facial vein into the internal jugular. How low down it is necessary to go in thrombosis of the vein itself depends, of course, upon the extent of the thrombo-phlebitis. By progressive compression downwards indications may be obtained of the point where permeability begins. Lesions of the carotid have never been observed in ligation of the jugular, and are scarcely possible, as in division of the sheath the vein may be isolated without any displacement of the carotid. In ligation of the carotid, phlebitis of the jugular, by irritation of the ligature, and erosion of the vein wall with hemorrhage have been observed by Von Nussbaum. The most available point for ligating the jugular appears to be the carotid triangle above the anterior belly of the omo-hyoid muscle. The previously mentioned experiences permit, in my opinion, the following conclusions for deciding the necessity and utility of ligation of the jugular in sinus-phlebitis. The systematic application of ligation as an integral part of the operative therapy of sinus-phlebitis is not justified. It is an error in pyæmia without sinus-phlebitis. A proviso for its application is the positive demonstration of sinus-thrombosis by examination of the contents of the sinus. In the presence of a solid occlusion in the direction of the jugular vein, if evidence is wanting for the assumption of the extension of the thrombosis into the vein, ligature is superfluous and under certain circumstances injurious. In addition, dependence on the general condition after the sinus has been opened as a guide for ligation of the jugular, as Jansen proposes, is questionable.

The principal point, in my opinion, in deciding as to whether or no the vein should be ligated, is dependent

upon the local findings in the vein itself, or at least at the central end of the thrombus.

Definite directions relative to the time at which one is justified in operating, the earliest date, and how long it may be postponed, cannot be given. The sole contra-indication for the operation aside from the natural consideration of the condition of the heart, etc., I believe to be purulent lepto-meningitis, the presence of which is to be demonstrated not only by the diffuse meningeal symptoms, which under certain circumstances accompany sinus-thrombosis, but most certainly by *spinal puncture*. Metastases, particularly of the lungs, do not exclude the carrying out of this operation, as Voss, Schmiegelow, and others have justly emphasized.

The question of what proviso must exist, what symptoms must be present, scarcely permits of discussion at the present time. An absolute clinical diagnosis, which it was formerly necessary to make from a demonstration of metastatic foci, is not at present so unquestionably necessary for the exposure of the sinus as formerly. With the possibility of directly recognizing thrombosis from the sinus itself, that is, by the application of exploratory operations, we are placed in a position to operate much earlier and with a greater prospect of success.

III.—THROMBOSIS OF THE CAVERNOUS SINUS.

Isolated thrombosis of the cavernous sinus requires, according to its pathogenesis, as also from its symptomatology, a special classification in contradistinction to analogous diseases of the other blood-vessels. Participation of the sinus cavernosus in a thrombosis spreading from the lateral sinus by way of the petrosal, is by far more frequent than exclusive disease of one or both of the cavernous sinuses. A general understanding of the genesis of this latter form has been particularly furthered by Koerner,¹ who pointed out the importance of the carotid canal in conveying suppuration to the cavernous sinuses and to the meninges. Among three cases of isolated thrombosis of the cavernous sinus observed

¹ *Zeitschr. f. Ohrenheilk.*, Bd. xxiii., S. 230.

by myself, in two the correctness of the diagnosis was substantiated by autopsy. In the third case the clinical evidences were so pronounced that any other explanation was scarcely possible. One of the cases given has already been published in the dissertation of A. Brieger. In this case both cavernosi were filled with pus, in addition to fresh coagula in both lateral sinuses and in the longitudinal sinus. The second case came under observation in an almost moribund condition.

K. M., aged fourteen. Marked fluctuating swelling back of the left ear; œdema of the brow and both eyelids; chemosis of the left conjunctiva; left eye very prominent, apparently immovable; pupils wide, not reacting to light; anæsthesia and total paralysis of the left half of the face; meatus filled with fetid pus; *anterior* and upper wall almost completely prolapsed.

Operation, June 10th.—Wide fistulous opening through cortex; mastoid walls and antrum filled with yellowish cheesy masses and flabby granulations. After scraping out the granulations a wide defect was found in the sigmoid sulcus, which after removal of its carious edges measured 4 *cm* in diameter. Sinus wall discolored, thickened, covered with granulations; weak cerebral pulsation; incision of the sinus evacuated fluid blood. In enlarging the incision upward, violent hemorrhage occurred, necessitating an immediate tamponade. In continuing the operation an extensive pus collection was exposed in the squamous portion of the temporal bone extending from above the root of the zygoma to the anterior wall of the meatus. Some forty minutes later the operation was discontinued, owing to weak heart action. The day following the operation the temperature was normal. The œdema of the lid and chemosis of the left eye perceptibly diminished. Ptosis, on the contrary, remained unchanged. October 10th, protrusion of the eye perceptible to a slight degree only; globe more movable; fundus normal. Death at 10.30.

Autopsy.—The left sigmoid sinus contains a large thrombus, non-adherent to the sinus wall; both the petrosal and left cavernous sinuses were empty; in the right cavernous sinus, however, a brownish-red thrombus was found firmly adherent to the walls. Further examination showed the sigmoid sulcus and the squamous portion of the temporal bone perforated; anterior and posterior surfaces of the pyramid unchanged; in the tympanum a large

amount of cheesy material ; malleus and incus wanting ; carious perforation on the floor of the jugular fossa. The medial wall of the osseous portion of the tube showed an irregularly shaped perforation, communicating with the carotid canal, in which similar masses to those in the tympanum were found.

The assumption of osseous tuberculosis, unquestionably justified both clinically and anatomically, was substantiated by the demonstration of tubercle bacilli in the cheesy masses removed from the tympanum. A thrombus was found only in the right cavernous sinus, although the clinical symptoms pointed mainly to an occlusion of the left. The clinical symptoms of this case correspond completely with the classical picture of thrombosis of the cavernous sinus. Exophthalmus, paralysis of the ocular muscles, immobility of the globe, œdema of the lids, chemosis of the conjunctiva,—in short, all those symptoms which may be met with alone or in various combinations,—were present here almost without exception.

Paralyses of the ocular muscles in sinus-phlebitis are frequently, perhaps generally, not caused directly by such phlebitis, but rather by the complicating meningitis. In uncomplicated thrombosis of the cavernous sinus also, they can scarcely be caused mechanically, as it is scarcely possible that the adjacent nerves could be compressed by the thrombus mass. It is more probable, as Robin assumes, that these paralyses arise, not through thrombosis, but rather through the phlebitis, the latter producing a neuritis. Changes in the background of the eye may be wanting in thrombosis of the cavernous sinus. In all three cases under my observation symptoms of stasis, if not of choked disc, existed. We must confess that no one of the many symptoms of thrombosis of the cavernous sinus, which have been designated as pathognomonic, is sufficiently indicative in itself alone to justify the diagnosis. In cases where thromboses originate quickly and without other complications, as in injuries, a more or less complete combination of all these symptoms is met with. The above case shows an unusually complete combination of all the characteristic symptoms. The assumption, therefore, seems to me justified that a

thrombosis of the left cavernous sinus, as well as of the right, had taken place, but after the operation, as shown by the subsidence of the symptoms of stasis in the area of the ophthalmic vein, the sinus had again become permeable. The same conclusion was arrived at in the following case :

B. K. ; age, twenty-two. Discharge from left ear ; large perforation with circumscribed caries of the labyrinth wall of the tympanum ; nine days later, slight swelling of the upper and lower lids of the left eye ; in the evening, marked chemosis of the conjunctiva ; perceptible protrusion of the globe ; on the following day, in addition to the œdema of the lids and chemosis, a small hemorrhage in the chemotic conjunctiva, paralysis of the abducens, hyperæmia of the left papilla, and marked congestion of the retinal veins. Operation three days later. At a depth of $3\frac{1}{2}$ cm the lateral sinus was reached, which presented a grayish-blue, prominent, pulsating tumor. Incision was followed by copious hemorrhage, which was controlled by pressure, in order that the operation might be continued. Antrum, small without change. The day following the operation, the symptoms of stasis in the area of the ophthalmic vein, œdema of the lids and chemosis, as well as the protrusion of the globe, had almost entirely disappeared. Two days later, findings were normal. Rapid recovery. Patient discharged cured on the 21st of April.

The diagnosis of sinus-thrombosis in this case after what has been said above scarcely permits of a more exact foundation. In addition to the well-known symptoms which were here united in almost scholastic combination, another condition existed, to the presence of which in thrombosis of the cavernous sinus Ziem¹ has called attention. This was the appearance of hemorrhages in the chemotic conjunctiva. In both cases pronounced and rapid recession of the symptoms of stasis in the area of the ophthalmic sinus followed the opening of the lateral sinus. This recession was so sudden in the two cases that all precautions in drawing conclusions could not obviate a causal connection between it and the operation.

I have given above quite thoroughly the grounds which

¹ *Wiener klin. Wochenschr.*, 1892, S. 379.

led me to assume in the first case, although the autopsy did not demonstrate it, thrombosis of the left cavernous sinus. This assumption is also supported by the demonstration of an adherent thrombus in the right cavernous sinus. Its origin might possibly also have been due to tuberculosis of the body of the sphenoid and thrombosis of the basilar sinus. Such isolated thrombosis of a single sinus on the opposite side to that corresponding to the disease is not a novelty. Jansen found in one of his cases an isolated thrombosis of the opposite inferior petrosal sinus as the point of origin of pyæmia and its explanation in an arachnitis transferred from the labyrinth of the diseased side. Another explanation applies to cases in which, in spite of characteristic clinical symptoms, the supposed thrombosed sinus is found pervious at the autopsy. The possibility must always be considered that during the autopsy a sinus may be washed out and appear macroscopically unchanged, although during life it was occluded. Thrombo-phlebitis is anatomically so passing and relatively rapidly changing a condition that a mistake between the anatomical findings and the clinical picture may easily take place. But even if in the former case the thrombosis of the right cavernous sinus did not originate by progression from the other side, but took place idiopathically, the fact that the symptoms of stasis upon the side where the thrombosis was demonstrated were essentially less than on the side where the vessel was found free, points to the fact that here had originated the most powerful cause for the origin of these symptoms. To this is to be added the demonstration of the thrombus in the left lateral sinus, which by incision and exploratory puncture was not found thrombosed. Here we were not concerned with a stratified thrombus in the usual sense, but rather with a centrally-decolorized homogeneous thrombus-nucleus, which was surrounded by a dark-red recent thrombus. More exact examination, unfortunately, was omitted. It appears to me to be not excluded that the nucleus of this thrombosis originated from the cavernous sinus, and gained access to the lateral sinus by way of the superior petrosal, where, in consequence of the interruption of the blood-stream set up

by tamponing the sinus, it was enclosed by this fresh thrombosis. It is possible that a thrombosis of the sinus cavernosus obstructing the flow from the ophthalmic sinus may have become loosened under the influence of opening the lateral sinus and, aided by the hemorrhage which ensued, was either thrown out or gained entrance into the circulation. That no manifest metastatic processes were excited thereby does not exclude this assumption. Embolic collections in cases of non-infectious thrombi may undergo rapid absorption without producing any clinical symptoms.

It is questionable whether it is possible for the opening of the transverse sinus to produce such an effect as I have here assumed. In general, this possibility, in my opinion, cannot be questioned. It has been previously stated that the blood pressure within the vascular system is sufficiently high, as a rule, to exclude aspiration of air when a sinus is opened. Positive statements relative to the height of the blood pressure in the venous spaces of the cranium are only in accord with this fact that the difference between the arterial and venous pressures is altogether different from that in other portions of the body. Of late Hill and Bayliss¹ have directly measured the pressure in the torcular and found that under physiological relations the pressure in the venous sinuses is in general similar to that within the cranium generally. From the height of the blood-pressure in the cerebral sinuses an explanation is found for the fact that when they are opened not only does no aspiration of air take place but on the contrary hemorrhage occurs often with the same force as from an artery. It does not seem impossible to me that, in such sinus hemorrhage if the venous blood flows with increased rapidity to the point of less pressure, coagula which are but loosely adherent to the walls of the cavernous sinus may be torn away and gain access to the lateral sinus by way of the superior petrosal. Whether this took place in both of my cases when the lateral sinus was opened is, of course, uncertain. It only occurred to me to point out the theoretic possibility of such an occurrence. The coincidence that the disappearance of the symptoms of thrombosis at the time of

¹ *Journal of Physiology*, vol. xviii., No. 4.

the operation was purely accidental is, in addition, opposed by the extraordinary rarity of spontaneous absorption of a thrombosis of the cavernous sinus.

Such occasional occurrences do not in the least alter the unfavorable prognosis. Operative treatment has up to the present time been followed by success in but one instance by Bircher.¹ In this case the entire pyramid was loosened from its connections. In isolated thrombo-phlebitis of the cavernous sinus Hessler² has recommended the method of operation proposed by Krause³ for the intracranial resection of the trigeminus as applicable for finding the sinus. Before the appearance of Hessler's book I had already tried this method on the injected cadaver and become convinced that the practical application of this procedure was very questionable and offered but few chances for success. The sinus has been repeatedly reached and injured, by Krause, Finney, and Czerny in trigeminus resection. My experiences permit at least one practical deduction: Exposing the lateral sinus in the cases in question, in which usually there is a suspicion of simultaneous thrombosis of the transverse sinus, is indicated mostly for diagnostic purposes. But once the sinus has been exposed, it is advisable to incise it with sufficient precautions. Further experience may produce a broader foundation for judging my hypothesis of the action of opening the lateral sinus upon thrombosis of the respective cavernous sinus.

¹ *Wiener Naturforscherversamml.*, 1894.

² *Arch. f. Ohrenheilk.*, Bd. xxxviii., S. 16.

³ *Verhandl. der deutsch. Gesellsch. für Chir.*, 1895.

A CASE OF PYÆMIA AFTER ACUTE SUPPURATION OF THE EAR: OPERATION;
RECOVERY.

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Translated by Dr. A. N. ALLING, New Haven.

Mrs. Sch., twenty-six years old, of healthy family, never previously ill, contracted a severe cold on March 1st, of this year. On the following night she had violent pain in the left ear, and on the next day pus came from the left ear.

The family physician ordered chamomile tea, syringing, and poultices. Yet the suppuration continued to increase.

On March 11th, by advice of the physician, she came to my clinic. She complained of sleeplessness, loss of appetite, lassitude, throbbing in the left ear, and pain in the left temple and back of the head. The left auditory canal, which was full of thick, green pus, after careful cleansing, was open in its whole extent. The drum membrane was deeply congested; posteriorly markedly swollen; anteriorly in the lower quadrant a small perforation, out of which pulsating pus was flowing. The mastoid process was not swollen; only at the apex was it somewhat sensitive to pressure. Temperature, 37.6°; pulse, 100. The perforation in the drum was enlarged; the canal was loosely packed with gauze up to the perforation, and ice compresses on the mastoid were ordered.

The patient came daily with subjective and objective symptoms unchanged.

On March 17th she remained away and did not come again until the 20th. She said that during this time she had felt so weak and had been so feverish that she was unable to come. The ear was suppurating freely; she had had, however, no pain in the ear,

but felt stupid, sometimes dizzy; had nearly constant pain in the left temple. She looked completely changed and gave the impression of being very sick. The canal was patent. The opening in the drum membrane was sufficiently large for the free flow of pus. The mastoid and region behind it were not swollen. Percussion of the skull showed tenderness only at the tip of the mastoid. The neck was freely movable; no swelling in any glands of the neck. No cord in the region of the jugular could be felt. Pupils were of equal size; tongue was dry and cracked; percussion over the lung everywhere normal; everywhere vesicular breathing; heart and liver normal; spleen *not* enlarged; no albumen in urine; temperature, 38.2° ; pulse, 110.

Transfer to hospital advised. On the afternoon of the 22d the patient was admitted. She had had a chill on the evening before but felt better again in the morning. Temperature after admission, 39° ; pulse, 116.

March 23d.—Chill, 8 o'clock in the morning; temperature, 40.4° ; 2 o'clock in the afternoon, 37.2° ; in the evening, 10 o'clock, chill, temperature, 40° ; pulse, also in the interval, 116–120. The examination of the other organs now showed *enlargement of the spleen*. Slight diarrhoea to-day. Chiselling was refused.

March 24th.—Morning temperature, 36.8° ; 6 o'clock, evening, chill, half-hour duration, temperature 41.6° ; later, copious sweating. 11 o'clock, evening, temperature, 39.2° ; pulse, 120–124.

March 25th.—Patient slept some toward morning, but felt very languid. Temperature, 36.9° . She gave consent to operation. 12 o'clock noon, temperature, 38.7° ; pulse, 112. Repeated careful examinations showed tenderness only at the tip of the mastoid; nowhere swelling. Unfortunately the background of the eye was not examined.

Operation.—Incision parallel to the insertion of the auricle (from 1 cm above the linea temporalis to the apex of the mastoid). Second incision at right angles backward from the middle point of the first. After elevating the periosteum, copious bleeding occurred from the veins in the bone back of the canal. A little pus oozed out of the dilated emissary mastoid vein. Yet with a probe one could feel, farther in, a solid thrombus. The first stroke of the chisel over the usual site for opening into the antrum exposed a cavity which was filled with thick pus and granulations. Probing showed that the cavity extended backward to the region

of the lateral sinus, below to the apex of the mastoid. The thin, necrosed bony covering was chiselled away as far as it extended, and the granulations were carefully scraped out. After the bleeding was stopped by pressure of a tampon and the cavity could be examined, the vertical part of the lateral sinus was seen to lie exposed on the posterior wall. The wall of the sinus, which was not changed and did not pulsate, was punctured, but neither blood nor pus were aspirated. From the opening of the sinus it was evident that we had to deal with a solid thrombus. Tampon in the wound cavity. Bandage.

During the narcosis the pulse went back to 86-90, two hours after the operation it was again 100. Temperature, 35.4°; 8 o'clock in the evening, 36.8°.

March 26th.—A chill at mid-day; temperature, 39.8°; pulse, 136; dressing changed; wall of sinus was unaltered; recumbent position strictly enforced.

On the following day at noon slight rise of temperature to 38.4°, from March 30th, normal temperature, pulse still rapid. Daily change of dressing, wound always showed fresh, healthy, granulations. The ear did not discharge again. The spleen on the seventh day after the operation could not be felt. On the tenth day the patient got out of bed for the first time, on April 10th she left the hospital, and on April 30th she was discharged, cured. Whispering voice could be heard with left ear at the distance of five metres.

REMARKS.

After the patient was taken to the hospital and was there carefully watched, it was easy to determine that we had to deal with otic pyæmia. The chill, the sudden rise of temperature to 41.6°, then the equally rapid fall to the normal, the rapid pulse which also remained at the same height during the intervals, the tumor of the spleen, the dry, cracked, thickly coated tongue, all supported the diagnosis. Further, I held that we had to do with pyæmia from an osteo-phlebitis. The pyæmia could arise from the seat of disease in the middle ear and in the mastoid process. That, besides the middle-ear suppuration, there was surely suppuration of the cells of the mastoid and probably also acute necrosis of the bones, was evidenced by the profuse discharge from the

ear and the tenderness of the mastoid to pressure. No outward symptoms of sinus-phlebitis were present. There was no œdema in the region of the temple, also none at the posterior border of the mastoid. There was no cord to be felt in the jugular region, and also other well recognized symptoms were wanting. After pyæmia was diagnosed there was but one treatment, opening and cleaning out the supposed primary seat of the disease.

The operation showed thrombosis and partial suppuration of the mastoid emissary, suppuration of the mastoid cells, and necrosis of the bone up to the still healthy sinus wall; thrombosis of the lateral sinus.

Although the sinus was found thrombosed, I incline to the opinion that the origin of the pyæmia was independent of the thrombus of the sinus. I hold that the infection from the seat of suppuration was propagated through the veins of the bone. The thrombus of the sinus probably originally occurred by extension through the mastoid emissary, while the sinus might have been infected directly from the adjacent seat of suppuration, yet the sinus wall would probably then not have been healthy and the thrombus would have completely broken down into pus.

The subsequent favorable course of the disease also corroborates the view that the pyæmia occurred from an osteophlebitis, for after the clearing out of the primary seat of the disease only one chill occurred. The temperature, however, only rose to 39.8° and, moreover, no metastases were observed.

ON THE SPONTANEOUS RECOVERY OF CHOLESTEATOMA AND CHOLESTEATOID AFFECTIONS IN THE TEMPORAL BONE.

BY DR. KONRAD REDMER, OF DANZIG, GERMANY.

Translated by Dr. J. A. SPALDING, Portland, Maine.

THERE are suppurations in the temporal bone and tympanum which are spontaneously cured by the morbid product being expelled along the natural channel, the external auditory meatus, leaving behind them in the bone, as the result of erosion, caries, or necrosis, peculiarly shaped cavities, which ultimately become covered with epidermis. All of the cavities bear a great resemblance to one another, and Zaufal is right in asserting that they look precisely like those which we artificially produce by modern operations for chronic suppuration of the middle ear and temporal bone.

Such cases, now, ought to be collected and investigated, because we have the right to assume that a more accurate knowledge of spontaneous cures may be of great value in developing our operative methods. For there can be no doubt that the most perfect methods in surgery are those which most accurately imitate nature's cures.

Four cases of spontaneous recovery having fallen under our care or observation, we feel inclined to publish them, though they really are not so rare as might seem, owing to the scanty literature bearing upon the subject. So far we have found none that exactly resemble our own cases, though the trouble may lie in the difficulty of accurately de-

scribing similar cases so as to make them clear to others. But this difficulty may now be said to be conquered, after reading recent and detailed accounts of the appearances observed after the operations which go by the name of Zaufal and Stacke. So then from reading of these which leave an opening resembling those observed in the spontaneous cures, we can get an accurate idea of the latter.

For example, every aurist knows what we mean when we speak of transforming, by means of an operation, the meatus, tympanum, and mastoid-antrum into a large single cavity. Now the absence of any such suggestive picture made it very difficult for the early aural specialists to describe the appearances of such a case, and so prevent us from understanding now, from their descriptions, whether the cases that they saw belong to the same class or not.

It would seem as if spontaneous cures were almost always due to the erosion of "*cholesteatomata*," which are finally spontaneously extruded through the natural passage, the external meatus. But the great diversity of opinion now existing over the whole question of what these tumors actually are, hinders any definite and clear decision.

The greatest obstacle to unity lies here. What is a cholesteatoma, and where does it originate?

The long-standing discussion of this point between pathologists and aural surgeons leaves both parties still in the right. For there are cholesteatomata in the ear and temporal bone which in the sense of the pathologists coincide with those discovered in other bones of the skull, as well as in the brain, meninges, mammary glands, ovaries, and testicles. These tumors are undoubtedly true tumors, not homologous, but actually heterologous in the sense in which Virchow uses that term.

Kuhn, for instance, has seen cholesteatomata which were actual tumors, and had nothing whatever to do with chronic suppuration from the middle ear. He has seen them where the *Mt* and meatus were absolutely normal, and again after a suppuration of so short a period that the discharge could not, by any human calculation, have anything whatsoever to do with the neoplasm.

Again, on the contrary, we see numerous cases of cholesteatoma in the middle-ear spaces secondary to suppuration.

Habermann and Bezold assert that the epidermis of the perforated *Mt*, or of the meatus, proliferates into the bony cavities of the middle ear, and that whilst the inflammation persists we have an over-production of epidermis, and, as a secondary result, the formation of cholesteatoma. It is only when they come to the etiology of the perforation in the *Mt* that these authors differ—Habermann declaring that a middle-ear suppuration has made its way out into the meatus, whilst Bezold refers the trouble to frequent catarrhal obstructions of the tube, as a result of which Shrapnell's membrane is pressed inward against Prussak's space, and so united with the adjacent tissues.

Leaving now aside the possibilities of the manner in which cholesteatoma originates, we may refer to Leutert's discovery in suppurating ears of epithelial cysts which histologically resemble the traumatic epithelial cysts of the skin, but in the ear, macroscopically, resemble cholesteatoma. If now these epithelial cysts are found in the ear, Leutert calls them cholesteatoma.

As it is therefore plain that entirely different sorts of "cholesteatomata" originate in the ear, it is incomprehensible how in otological literature all these things are still labelled with the same name. By cholesteatoma in the ear we understand (and we cannot understand anything else) that which pathological anatomy in other parts of the body calls by that name (in Virchow's sense of heterologous tumors); in other words, cases such as Kuhn has described. All other secondary accumulations of epidermis should never be entitled "cholesteatoma," but, according to their genuine nature, "retention masses, resembling cholesteatoma," or "hyperplastic epidermis," or "epithelial cysts."

Practically, the difficulty in keeping to this distinction is great, because so many similar productions have the same final effect. But at the post-mortem table it is easy to recognize a genuine cholesteatoma when we find it in the temporal bone without suppuration in the tympanum or perforation of the *Mt*. When, however, a genuine cholesteatoma has become infected by an accidentally simultaneous suppuration, and in its turn now maintains that suppuration, the

anatomical differentiation, and still more the clinical, from hyperplasia of the epidermis becomes difficult or indeed impossible. Often we see cases described in which it is doubtful whether the cholesteatoma is to be regarded from Virchow's point of view, or from that of Habermann or Bezold. Sometimes we cannot suppress the suspicion that the so-called cholesteatoma is nothing but thickened and caseous pus in the antrum and adjacent cavities.

Thus, for instance, the antrum in children is often filled with just such cheesy pus, which, during treatment, is often formed anew, and after syringing away we see coarse crumbs or scaly tissue, which bears great resemblance to cholesteatoma. But on examining this refuse with the microscope, it is found to be nothing but pus-corpuscles, which have been compressed against the walls of the cavity, and have so taken on a scale-like appearance. Hence when we see or hear of operations for cholesteatoma in small children, in whom no microscopical examination has been made, of the evacuated masses, we are actually to think of collections of pus and not of cholesteatomata at all.

There is but one condition in the ear which is of any value in forming a differential diagnosis between a genuine cholesteatoma and the hyperplasia of epidermis in the middle-ear spaces. Bezold has expressed the opinion, that epidermis can only proliferate into the middle-ear spaces, where the epidermis of the *Mt* is carried over to the mucosa of the tympanum by a sort of bridge, that is to say, by the union of the margin of the perforation with the mucosa, or where the *Mt* is totally destroyed to the very margins. If now, this opinion be true, and it seems to all observers extremely probable, then such a condition of affairs in doubtful cases would be of the greatest value in the diagnosis between hyperplasia of epidermis and accumulations in the middle-ear spaces, but not, as Bezold erroneously states, for the diagnosis of a genuine cholesteatoma.

The difficulty of separating clinically these varieties of disease may be the reason why opinions still vary in regard to the prognosis as well as to the best method of operation in cholesteatoma.

One opinion, often expressed, is that, relapses being unavoidable, we must maintain a permanent opening behind the ear by transplantation of skin, through which to remove, from time to time, the masses as they constantly recur. The other opinion is that in avoiding the cavity behind the ear, and by the greatest possible removal of pathological masses through the meatus, and deepest possible excavation of the adjacent territory, relapses are prevented, whilst by a plastic operation at the orifice the bony cavity is rendered permanently visible.

These two operations with their modifications differ then from one another in that in one we have an opening behind the meatus, in the other it embraces the meatus. So that there is no actual difference, only in the locality and the size of the permanent cavity. The main idea is to keep the latter dry and as much as possible accessible to view. But where this can be permanently obtained from the meatus itself, it seems to me that no one will ever desire to make the monstrous opening behind the auricle.

Finally, let me say that the operation as suggested by Zaufal, embracing the meatus and adjacent tissues, makes a cavity which greatly resembles that produced by the curative processes of nature, and is probably the most correct one to perform.

A brief history of four cases of spontaneous recoveries is now appended. Of the first we have only the skull to show (as discovered in the Rostock Museum), whilst the other three were observed during life at our clinic.

CASE I.—Female skull, at the age of about twenty-five. The external surface of the mastoid is sawed away so as to leave the spaces open. The left mastoid exhibits the usual pneumatic spaces, whilst the right is transformed into a large cavity of sclerotic bone without pneumatic cavities. The cavity is formed by the breaking down of the tympanum, mastoid, antrum, and meatus. The posterior and upper walls of the meatus have disappeared, and the lower wall is eroded. The promontory and windows of the tympanum are normal. The facial canal is transformed into an open cavity about 6 mm in length. The vestibule above is slightly opened. The cavity behind extends to the sigmoid flexure, outward to the cortical tissue of the mastoid process, and at the mastoid fossula (antrum pit) is a perforation outward with smooth walls.

The cavity is 25 mm high, 23 mm in antero-posterior diameter, and 21 mm from the promontory to the edge of the meatus externus. There are no fissures between the tympanum and fossa jugularis, nor between the tympanum and carotid canal. The cavity is nine-pin shaped, due to the considerable share which the meatus takes in the formation, and owing to the fact that the threshold between the tympanum and mastoid antrum, generally so prominent in the other cases to be reported, is here very much flattened by erosion. The walls of the cavity are smooth, shiny, free from caries or necrosis or from osteophytes; in other words we see a perfect bony surface.

We know nothing of the history of the case, nor of the cause of death, but the anatomical condition shows a cavity due to no other cause than an extensive and genuine cholesteatoma. The remarkably nine-pin-shaped appearance shows a uniform enlargement from erosion, to which only the hard bony substance of the cochlea, and the resistant lamina vitrea, offered any resistance. A cavity so regular in form could not possibly have been caused by simple suppuration in the bone, nor by hyperplasia of epidermis into the middle ear, but only by a genuine and gradually enlarging tumor, and, considering the locality of the growth, only by a true cholesteatoma. We can even go farther and assume that the cholesteatoma was cured, and that it was exfoliated spontaneously, and that the recovery must have existed for some time before the patient's death. So long as it remained in the meatus, it remained in contact with the open air. But in such cases, from easily comprehensible causes, and according to general experience, there exist in and about the tumor inflammatory processes which are easily recognized by the roughness and necrosis on the bone. But here the interior of the cavity is smooth, and thus we see that no inflammatory processes could have existed for quite a while at least before the death of the patient.

In the three ensuing cases we cannot diagnosticate a genuine cholesteatoma, but simply "*chronic otorrhæa, with occasional exfoliation of cholesteatomatous masses, or masses resembling that sort of tissue.*"

CASE 2.—Mrs. H., æt. forty-six, March 23, 1888, has suffered for years from suppuration of the right ear, but had no treatment. Lately, slight pain in the ear led her to seek advice. Right meatus filled with a plug of cerumen, offensive pus, and layers of epidermis. After removal of this plug, granulations, discovered in the bottom of the meatus, were treated with the snare and chromic acid. Later still, scales resembling cholesteatoma were removed from time to time by syringing or with a curette.

After the meatus was finally thoroughly cleansed, the lower half of the *Mt* was seen to be preserved, with cicatrices. Most of the upper portion of the *Mt* is lost, and we can see that the lateral bony wall of the tympanum is gone, so that the tegmen tympani lies plain in sight. Backward, the cavity extends into the mastoid cells. A sort of ridge lies between the tympanum and mastoid antrum, within which the facial nerve is to be traced. The suspensory ligament of the hammer is lost. The stapes can be seen in good preservation.

Suppuration still continued to trifling amount in September, but the capacity of the cavity, being measured by filling with water, was found to hold double that of the other meatus. In January, 1889, a fresh granulation was removed. In 1890 the patient reported once more with thickened scaly masses in the ear, which were again removed with the syringe. A few weeks later the cavity was dry and has remained so during the past six years.

CASE 3.—A boy of sixteen has had otorrhœa on the left side since childhood. The right ear was also slightly affected at the same time. In July, 1895, the right *Mt* showed a small dry perforation, whilst the hammer and a part of the perforation margin were adherent to the tympanic wall, which was covered with epidermis.

The left meatus is filled with a hard plug, which could not be removed either by syringing or with the forceps. But after being softened and smoothed with glycerine it was easily removed and found to be 2.5 *cm* long and covered with crumbling masses of cerumen and softened epidermis. The interior was occupied with a hard pyramidal body about 1.5 *cm* in length, which on closer inspection *proved to be a sequestrum*. The microscopic examination showed it to be composed chiefly of softened epidermis. Examination of the meatus now showed that the entire tympanum, together with the recessus epitympanicus, the mastoid antrum, and the posterior portion of the meatus, had been transformed

into a single large cavity. The region of the promontory is sunken. The ossicles are absent. The epidermis on the medial antral wall is thicker than at other portion. A few days after removal of the plug the cavity was dry, with the exception of the spot of thickened epidermis. On tuning-fork examination the patient declared that he could perceive sounds in the right ear. He was not seen again.

CASE 4.—Miss F., æt. thirty-eight, observed a slight, painless discharge from the right ear in 1883. In 1884 she had an attack of vertigo and nausea, with loss of equilibrium. This condition ceased after ten days, the chief treatment being ice-bags to the head. In 1884 polypi and whitish scales are reported to have been removed from the ear. In 1885 there was slight hemorrhage from the ear, which was soon relieved by the use of iodoform.

The patient also asserts that about the same time a deep incision was made into the meatus.

August, 1895.—Deafness right ear; loud voice only close to the meatus. Tuning-fork heard only on the healthy side—the left.

Examination of the meatus shows a large cavity filled with epidermis, and embracing the recessus epitympanicus and the mastoid antrum. At the bottom of the hole a ridge divides it into two portions. This represents the threshold separating the tympanum and mastoid cells, and in which the facial nerve courses. The promontory and both windows are normal. The ossicles are absent. No hyperplasia of epidermis. Tubes free. During the time that the patient remained under observation (several months) nothing was observed in the cavity but a few flakes of skin. The capacity of the cavity was not measured, as we feared that the presence of water would excite fresh inflammation and suppuration.

These cases are published simply to call attention to the possibility of others coming to light. *The observation of the manner in which such cases proceed, and the picture which they offer in individual cases, will surely give us suggestions valuable for operative interference in other cases, by means of which we shall then obtain greater surety of a favorable result. Our investigations seem to prove that true cholesteatomata, as well as cases hitherto called by that name, can be spontaneously ex-*

foliated through the meatus and so be cured. Therefore, we are of the opinion that all such masses, of whatsoever nature, ought to be removed by Zaufal's method without a permanent retro-auricular orifice. Further observation will show in which cases this method shall prove to be the most trustworthy.

For we have a right to believe that genuine "cholesteatoma," Habermann's "retention masses," Lentert's "epithelial cysts," and eventually other epithelial morbid products resembling cholesteatoma, so far as the prognosis of relapses is concerned, will offer differing results, and for that reason ought to be operated in various ways.

Finally, I mention the *significance of closure of the tubes*, as suggested by Haug and others (possibly, too, to be artificially produced), in the cure of "cholesteatomatous" cavities. The idea of closing the tube, is that we shall thus prevent the entrance of moist air and micro-organisms into the operative cavity and so prevent a new infection. To me the suggestion seems visionary indeed. For in Case 4 the bony cavity had been cured for ten years, despite the fact of a patent condition of the tubes. In the other cases we unfortunately made no observation of this condition. But, more than this, we conclude from other observations, that extensive ventilation of the middle-ear spaces through the meatus and tubes can only act favorably upon the diseased mucosa. And here we recall the fact, that the permanent cure of chronic middle-ear suppuration in children with adenoid vegetations in the naso-pharyngeal space is only obtained when the tubes again become patent by removal of the vegetations.

And here let me cite a case of a young girl who was operated upon by Koerner's method. The empty tympanum (only the plate of the stapes remained) rapidly clothed itself with epidermis. Before the operation, whisper at 50 cm, and after at 450 cm. Finally, mulberry-like granulations appeared on the inferior turbinates, nasal breathing was obstructed, and hearing for whispered sounds fell to 250 cm, though the cavity in the ear remained unchanged. After removal of the hypertrophies with the snare the hearing became as good as before. The patient also observed that when she had a cold she heard worse.

This case can be explained thus: That the epidermis which covered the cavity remained absolutely dry with good ventilation, whilst when the ventilation became impeded it swelled again and diminished the mobility of the stapes. The idea, therefore, is not far-fetched, that such a swelling makes the epidermis more susceptible to any renewed infection.

ACOUSTIC RAILWAY SIGNALS AND ACUTENESS OF HEARING.¹

BY DR. H. ZWAARDEMAKER, OF UTRECHT.

(*With Plates IV. and V. of Vol. XXVIII., Germ. Ed.*)

Translated and Abridged by Dr. CHARLES H. MAY, New York.

IN 1880, S. Moos called attention to the dangers to which the public were exposed on account of certain diseases of the ear occurring in locomotive engineers and firemen, and related five instances of this kind ; one of these was an engineer whose deafness had been responsible for a collision. He believed that certain unexplained railway accidents might be traced to impairment of hearing on the part of employees. In 1881, D. Schwabach published statistics showing thirty-three cases of organic ear disease among 160 railway employees, but he failed to determine to what extent such diseases incapacitated the person in the proper performance of his duties. Such information was supplied by H. Pollnow, who made a study of the six signals used by the company whose employees Schwabach had examined.

These signals were the following :

1. The conductor's signal for starting, given with an ordinary whistle.
2. The signal for stopping, given with an ordinary whistle.
- 3 and 4. Switching signals, given with an ordinary whistle or horn.

¹ An address delivered at the International Conference of Railway and Steamship Surgeons, held in Amsterdam, September 20 and 21, 1895.

5. The explosion of a cartridge placed upon the rails.
6. The steam-whistle.

While riding upon a locomotive, Pollnow found the noise so great, that to understand speech it was necessary to shout into the ear ; neither the rolling of the cars nor the conductor's whistle could be heard ; but the report of cartridges and the steam-whistle could be heard easily, even by employees who were unable to hear whispered speech beyond one metre. Pollnow arrived at the conclusion that the ordinary whistle was absolutely worthless in signalling trains in motion, but that the important signals given by the steam-whistle and the cartridge could be heard even by those who suffered from deafness of a comparatively high degree. Regarding these two signals as essential, he considered employees fit for duty if able to carry on an ordinary conversation, taking into consideration the fact that in signalling, optical signs are added to those perceived by the ear.

It is not surprising that a sharp controversy followed the publication of such widely differing views. Moos pointed out that optical signals were not official, and were of no value at night or during unfavorable weather ; while Pollnow endeavored to strengthen his own views by the evidence of railway surgeons who found that the employees did not consider themselves handicapped by disturbances of hearing. Moos's views were endorsed by Bürkner, Lichtenberg, and Schmalz, while Hedinger rather agreed with Pollnow. This difference of opinion makes the subject a proper one for consideration at this conference.

It must be admitted, that in the case of old and practised employees, certain defects of the organs of sense are offset by the advantages of experience, and in this way, such men prove more reliable than younger and inexperienced persons ; but it is evident that this is true only within certain limits, and the question arises, what are these limits ? After these have been established, it will be necessary to subject railway employees to aural examinations at regular intervals, investigation having established the fact that the percentage of employees afflicted with ear disease increases with the length of service. A locomotive engineer who had

perfect hearing upon entering the service as fireman, will probably suffer from some diminution at the end of several years. This is shown by Hedinger's table.

TABLE SHOWING THE NUMBER OF EMPLOYEES WITH HEARING LESS THAN SPEECH AT ONE METRE.

Length of Service.	Total Number of Employees Examined.	Percentage of Employees Affected.
1 to 5 years	24	25 per cent.
5 " 10 "	37	35 " "
10 " 15 "	44	50 " "
15 " 20 "	25	60 " "
20 " 25 "	10	90 " "
25 " 30 "	6	75 " "

This table shows that with succeeding years the number of employees with hearing less than speech at one metre increases. This result was originally attributed to the heat and poisonous gases from the fire, changes in temperature, dust and smoke, especially since pharyngeal- and middle-ear catarrh occurred frequently, while labyrinth affections were seldom found. But later, Bürkner showed that the older engineers also suffered from loss of perception of the higher tones with diminution in bone-conduction, symptoms resembling those of boiler-makers' deafness. This is not surprising, since a running locomotive makes a great deal of noise, and, as a result, the traumatic effects of concussion are added to those of catarrh.

Let us now endeavor to establish the limit value of the power of hearing within which railway signals can be heard sufficiently well. This limit cannot be measured by the acuteness of hearing for whispered or ordinary speech, because although an extensive series of tones of varying pitch are used, we know that important tone-gaps may exist without noticeable interference with the power of hearing speech. This becomes evident upon considering the distribution of tones of various pitch. First in importance are the vowel sounds which occupy a position in the scale varying somewhat according to the dialect, between c^2 and f^4 ; above

these are a series of sibilant consonants which, according to O. Wolf, extend to c' ; and below, there are a number of mutes which, according to the same authority, extend pretty far down the scale. In speech, these tones are employed in varying degree. We appreciate spoken words by several determining sounds, for instance, the open vowels and the initial and final consonants. If we hear one of these less plainly than the others, we select some other letter in the word. A person whose hearing is defective on account of the existence of a tone-gap, will not seek the determining sounds within the missing portion, but from the neighboring part of the scale; in this way, he preserves good hearing. But in endeavoring to catch a certain signal the pitch of which happens to correspond to that of the tone-gap, he would be absolutely deaf so far as this signal is concerned.

This led me to determine the pitch of the various railway signals—the same signals which Pollnow investigated:

I. *The Ordinary Whistle.* In Holland, the conductors and their assistants are provided with wooden whistles, consisting of small covered organ-pipes about $1\frac{1}{4}$ cm long. Slight blowing produces a tone of 5,550 vibrations, f' ; with greater force, the tone is c' . Most whistles produce tones occupying that portion of the scale comprised between the fifth and seventh marked octaves—tones corresponding to the upper portion of human perception. This probably explains why the wooden whistle is provided with a ball in its interior; the to-and-fro movement of the sphere causes changes in pitch, thus preventing the exhaustion which would follow the continuous perception of the limit-tones.

Can the older engineers hear the ordinary whistle sufficiently well? The answer to this question depends upon what we consider sufficiently well. It is certain that they do not hear the whistle as well as persons with normal ears. The shrill tones approximate the limit-tones of human perception, which are lost or diminished to older engineers, leaving only the weak fundamental tone in the fifth marked octave; this would not likely be heard against the wind beyond the length of several cars. There are a number of indications which go to show that this signal is not suffi-

ciently well heard ; and I was assured by the employees that the engineers are frequently unable to hear it at all.

II. *The Signal-Horn.* This is a much louder signal. The horn which I used in my experiments was tuned to *a d'orchestre*, a tone corresponding to the middle of the scale of human perception. This pitch is particularly well selected ; the tone can be heard comparatively well, even though the upper limits of the scale have been curtailed by labyrinth disease, and the lower by repeated attacks of catarrhal processes. Only severe forms of sclerosis would interfere with the perception of this tone, and since it approximates the characteristic tone of the open vowel *a*, we are justified in assuming that persons who are unable to hear it must suffer from such marked diminution of hearing for speech that their deafness would be quite noticeable. Therefore, all engineers in active service can undoubtedly hear the signal-horn which has been tuned to *a d'orchestre* more or less plainly, even though some diminution in the acuteness of hearing exists. When the locomotive is in motion, there might be some difficulty in hearing, especially since, according to Gradenigo, acoustic exhaustion is a prominent symptom in boiler-makers' deafness. With a strong and interfering wind, this loud sound is deadened to an astonishing degree, and the distance at which the switching-horn can be heard is very much diminished. Under such circumstances, with the train in motion, it seems likely that this signal can only be heard by the normal ear.

III. *The Steam-Whistle.* The steam-whistle of locomotives is supposed to be tuned to a relatively low fundamental tone, *a*¹, for instance ; but when the steam enters with greater force, upper tones are added, eclipsing in intensity the fundamental tone and approaching in pitch the upper limits of human perception—the portion which, according to Bürkner, is most defective in older locomotive engineers. This may explain the frequent sounding of locomotive whistles of such uncomfortable intensity ; the high tone which sounds so harsh and is so distressing to the traveller, seems weak to the engineer ; unconsciously he whistles for a long time and lets

the steam in at full force. This seems remarkable, because with ascent of pitch the intensity for a diseased ear diminishes. Perhaps the accompanying hissing makes the perception of the tone more difficult, while the total excitation of the sound increases—as was pointed out long ago by Burkhardt-Merian in connection with Galton's whistle.

From the standpoint of the aurist, there are undoubtedly many of the older employees who hear the steam-whistle with diminished intensity and, at a distance or against the wind, only with difficulty. On account of the importance of the signal, it is possible, under certain circumstances, that this jeopardizes safety.

IV. *The Explosion-Signal*.—In the infrequent instances in which it is employed, the explosion-signal, produced by a cartridge placed upon the tracks, is even of greater importance than the steam-whistle. Such a report consists of a strong principal vibration, to which is added a series of rapidly diminishing auxiliary vibrations. According to Exner and Brücke, these aperiodic vibrations are perceived by the same end-apparatus which analyzes periodic sound vibrations. Probably a series of fibres of the membrana basilaris in immediate proximity is excited, the position of which determines the apparent pitch of the report. On account of the extensive area of the excitation, it is probable that the explosion of a cartridge is heard even by a diseased ear with tone-gaps corresponding to the upper and lower portions of the scale; this view agrees with the results of Pollnow's investigations. The report-signal, therefore, answers its purpose perfectly.

If, in any given case, we wish to ascertain whether a person can conveniently hear the signals just enumerated, the simplest way is to examine the man with Bezold's continuous series of tones and thus map out a field of hearing. We may make use of the original method of Hartmann, of that of Gradenigo or of the plan which I have recommended; practically, all these methods accomplish the same results. This is shown, in a typical case, by the figures on Plates IV. and V.

The simplest plan is to determine the upper and lower

limits of tone perception, then to discover any tone-gaps and finally to examine the acuteness of hearing at a number of points by means of tuning-forks. Such results are marked upon a chart, a curve is drawn joining the ascertained heights of ordinates, and the pitch of the signals is noted; a glance will then suffice to determine exactly to what extent the deafness of the individual interferes with his power of hearing signals.

Let me illustrate by an example occurring in a machinist, thirty years of age, who presented a moderate amount of sclerosis with slight loss of the upper tone limit. This man could hear the ordinary whistle pretty well when it sounded its fundamental tone. The first over-tone, the octave, produced by forcible blowing, was heard less distinctly. He heard the ordinary whistle, forcibly blown, at about one-twelfth the normal distance; when softly blown, at about three-fifths the normal distance. Let us assume that the latter is somewhat over two kilom., which was the result arrived at by my measurements. Then the man's hearing distance for the whistle would be 200 metres. In the absence of wind, this would just be sufficient to enable him to do switching duty; but in wind or rain, he would clearly be incapacitated from such service.

He could hear the steam-whistle comparatively well when blown softly, but less distinctly when forcibly sounded. Finally, the report-signal would probably be heard very well by such a patient, though the period of reaction would probably be of somewhat greater duration than normal on account of diminished excitation. Under certain circumstances, this might give rise to danger, especially since, even in the normal ear, the period of reaction is somewhat longer on account of the suddenness of the report-signal.

In regard to hearing for speech, it is evident that this ought not to be diminished beyond a certain degree. While the locomotive is in motion, it is often necessary for the engineer to give a command to the fireman or to consult with him. Agreeing with Pollnow, my experience convinced me that even for the normal ear it is difficult to understand speech when travelling upon a locomotive. In certain cases,

the paracusis Willisiana might be of advantage to the affected ear; but we have no knowledge that this symptom is present in locomotive engineers and firemen. Even when the locomotive is at rest, defective hearing gives rise to difficulty and danger through misunderstanding, for we all know how often, under such circumstances, the opposite is done of what has been commanded. Hence, even for older railway employees, I believe the minimum requirement should correspond to that adopted by military regulations—the whispered speech at one metre.

We are led to the following conclusions :

1. When engaged for service, locomotive engineers and firemen should possess normal hearing in a general way, or at least not more than a slight diminution.
2. At intervals of from two to five years, they should be re-examined with a continuous series of tones and their field of hearing determined; this will then indicate their ability to hear acoustic signals sufficiently well.
3. Employees on duty should have a hearing distance for whispered speech of at least one metre.

REPORT OF THE AUSTRIAN OTOLOGICAL SOCIETY; MEETING OF APRIL 28, 1896.

Translated by Dr. C. H. MAY, New York.

DEMONSTRATIONS.

1. Prof. J. GRUBER presented a six-year-old girl with **Malformation of the Auricle and Absence of the External Auditory Canal with Marked Asymmetry of the Face.**¹ Dr. Gruber did not expect any good result by trying to increase the hearing in this ear, but thought the auricle, which was tilted forward, could be stitched back and in this way the appearance of the child could be improved.

2. Dr. FERD. ALT presented a patient, forty years of age, who took 149 grammes of salicylate of sodium for acute muscular rheumatism. From the beginning of the disease, there was tinnitus in both ears, accompanied by a dull headache. In November, while still taking the salicylate, she began to have attacks of vertigo in which she fell to the right and became unconscious for a short period. Tinnitus of the right side was constant. These attacks were repeated every two or three weeks at first; of late they were of daily occurrence. *R E M!* entirely replaced by a cicatrix. Weber lateralized to the left. Rinné +, left. On the right side neither high nor low tones of the tuning-fork are perceived, and when applied to the mastoid, they are referred to the left ear. Watch: left, 1 metre; right, 0. Loud speech is heard on right side only in immediate proximity (probably heard by left ear). The case is interesting because the use of large doses of sodium salicylate undoubtedly produced labyrinth (acoustic) disease, and because this affection was unilateral.

Dr. POLLAK inquired whether his colleagues had had any success

¹ See a similar case, with drawings, in these ARCHIVES, vol. xix., p. 17.

in the treatment of Ménière's disease with quinine. He had had favorable results with small doses, 0.10 given three times a day. GRUBER, POLITZER, and URBANTSCHITSCH reported unfavorable results from the use of quinine, especially in large doses, and on this account had discontinued the use of this remedy.

3. Dr. ALT also presented a patient, forty-six years old, who, while intoxicated, had fallen down a flight of stairs and lay unconscious. Upon recovering consciousness, there was hemorrhage from the nose and the right ear. Several days afterward, he presented himself at Gruber's clinic in the following condition: The right side of the face was swollen and discolored, right sclera presented extensive subconjunctival hemorrhage; almost complete right-sided facial paralysis; normal fundus; movements of eyeball complete; sense of smell and taste normal; no disturbances of X., XI., and XII. cranial nerves; pulse 84; temperature $36^{\circ}.3$; in front of the right ear there was a sensitive swelling of the size of a nut; the region of the tragus was discolored, the canal open and its walls covered with dried blood. A soft tumor, about the size of a bean and of a dark reddish-blue color, sprang from the upper and posterior walls of the canal and concealed the greater part of the drum-membrane, the visible portions of the latter being of a livid color and bulging; left ear normal; Weber lateralized to left; Rinné +, left. Neither high nor low tones are heard by right ear, and when the tuning-fork is placed upon the mastoid the sound is referred to the left ear. Watch, right o. Unsteadiness when standing with eyes closed; in walking there is a tendency to fall to the right. In hawking and blowing the nose, clotted blood escapes from the mouth (right side of the nose). After the lapse of a week, the swelling in the canal had disappeared, and at the end of twelve days there was no longer any escape of blood upon hawking or blowing the nose, and the right drum-membrane presented a normal appearance. The facial paralysis disappeared rapidly under Faradism. The vertigo was replaced by tinnitus. The tuning-fork signs remained the same.

4. Dr. ALT also presented a boy, seven years of age, who was brought to Gruber's clinic in January, 1895, for **congenital deaf-mutism**. Both parents were deaf-mutes and had been educated in an institution. A younger sister was hard of hearing. The drum-membranes of the patient were normal. There was no response to the voice, whistle, or trumpet, and he gave no signs of

having perceived the tones of a tuning-fork applied to the head. Acoustic exercises were begun at the clinic and continued by the boy's relatives. Two months later, the boy was able to hear and repeat every word which was addressed to him. Previous to his visit to the clinic, his relatives had considered him a deaf-mute and took no pains to teach him how to speak. As a result of the acoustic exercises, he came in constant contact with these relatives, who, unlike his deaf-mute parents, conversed with him; in this way he received acoustic impressions and learned to talk. Such children must not, of course, be placed in institutes for deaf-mutes; it is very easy to make them hear and speak by removing them from their deaf-mute parents.

Discussion.—POLITZER considered the case one of psychic deafness and GRUBER and URBANTSCHITSCH agreed with him. The latter cautioned against placing such children in institutes for deaf-mutes since, under such circumstances, there would be no possibility of a return of hearing.

5. Dr. MAX presented a man, twenty-nine years old, who had a **Peculiar Defect of the Left Auricle.** Corresponding to the middle of the upper half of the left auricle there was a circular opening about the size of a cherry-pit, beginning in the upper third of the antihelix and extending upwards about 7 to 8 *mm.* Beyond the upper extremity of this defect, the normal upper two-thirds of the crura antihelices were seen. In other respects the auricle was normal. The margins of the defect were sharply defined and not cicatricial, and the corresponding posterior surface of the auricle presented an opening of the same size and characteristics. The defect was not congenital but developed in the course of a few months during the second year. No information could be obtained about the original disease.

TRANSACTIONS OF THE FIRST AUSTRIAN
OTOLOGICAL CONGRESS, HELD ON
JUNE 28 and 29, 1896.

ACCORDING TO THE OFFICIAL REPORT OF DR. JOSEF POLLAK.

Translated by Dr. MAX TOEPLITZ.

The Otological Congress was opened by Professor JOSEF GRUBER with a welcoming speech. For the following year Professor POLITZER was elected President, Professor GRUBER Vice-President, the private docents POLLAK and BING Secretaries, and Professor URBANTSCHITSCH Treasurer. Forty-three aurists were present.

I.—DEMONSTRATIONS.

1. Director HELLER demonstrates a **Case of Psychic Deafness.**

A boy, aged three and a half years, could not understand, before the beginning of his instruction, a single word addressed to him, and his attention could not be directed to other perceptions of sound. He exhibited to the utmost reflex reactions, and these only upon very loud impressions of sound. Among the word fragments still present, the words "mamma" and "Berta" were the most distinct, but without meaning to him. In addition, the boy, as a rule, was in a state of extreme motory excitement, which at times increased to regular maniacal paroxysms, during which the child vehemently cried at the top of his voice, struggled with hands and feet, bit at the nurses, and injured himself. After the excitement had reached such an extreme degree, a reaction in form of complete collapse ensued.

In entire contrast with the unsusceptibility of the boy to isolated *loud* perceptions of sound was the fact that melodies pro-

duced by a music-box or grinding organ were best suited to quiet him somewhat, even during paroxysms of excitement. Slow improvement took place after treatment of four months' duration, which, psychically quieting, succeeded in exciting the consciousness of the connection of word and subject. At the time of the presentation the boy was able to speak and understand everything.

2. Professor URBANTSCHITSCH demonstrated **Eight Cases of Radical Operation**, in which the retro-auricular opening had closed; and

3. **A Case of Psychic Deafness.**

4. Professor GRUBER: **Angioma of the Auricle Cured by Operation.**

GRUBER presents the illustration, taken from nature, of an angioma of the auricle, which neither by its exterior nor by the exactest objective examination betrayed its nature, but rather exhibited the symptoms of an ordinary atheroma. It was operated with knife and sharp spoon without much loss of blood.

5. Professor POLITZER: **A Cured Case of Otitic Pyæmia with Thrombosis of the Jugular Vein and Purulent Metastasis in the Left Elbow-Joint.**

A young man, aged nineteen, was seized, when seven years old, with severe scarlatinous diphtheria of the nose, naso-pharynx, mouth, and both tympanic cavities, which ended in almost complete destruction of both membranæ tympani and considerable loss of hearing.

Ten years later an acute exacerbation set in in the right middle ear, implicating the mastoid, which had to be opened, and after two days the sinus was laid bare, since the temperature had continued to be high (39°-40° C.). The sinus appeared normal, but its blood contained streptococci. No improvement took place and the temperature remained high with daily chills. A painful swelling upon the right side of the neck now appeared, which proved to be a thrombus in the jugular vein.

The daily chills continued for two weeks, together with the development of a phlegmonous inflammation around the thrombosed jugular vein, exhausting the patient's strength. On the twenty-second day since the beginning, a purulent metastasis developed in the left elbow-joint, whereupon the chills ceased and the temperature decreased to normal. The patient was cured after four weeks with an ankylosis of the joint and occasional moderate bilateral otorrhœa.

6. Dr. BING presents a **Case of Chronic Purulent Otitis Media which recovered after Removal of the Malleus.**

7. Dr. GOMPERZ presents a girl in whom, on account of caries, the **Radical Operation with Koerner's flaps** was performed.

The condition of the posterior flap formed from the external meatus aroused the keenest interest. After its firm attachment, it had grown over the antrum and the tympanum so as to make the external meatus appear at the bottom as closed by a membrane, communicating only through a narrow opening with the tympanic cavity. After cessation of discharge which had found its way through this opening, the latter began spontaneously to increase, apparently by absorption—not by necrosis—of the covering cutaneous flap, and after two weeks the antrum, attic, and tympanum, lined by delicate, glistening cicatricial tissue, were exposed in the way they presented themselves at the demonstration.

8. Dr. MAX presents the patient with the **Auricular Defect** demonstrated at the last meeting of the Society as cured.

He succeeded in closing the defect by sewing the trimmed edges together with three sutures under cocaine.

II.—PAPERS.

1. Dr. R. SPIRA, Cracow : **A Case of Central Otitis of the Mastoid Simulating Neuralgia of the Trigemini.**

A robust man, aged seventy-three, suffering for some time from chronic otitis media, was seized with acute tympanitis following influenza. Simultaneously, severe pain in the neck and larynx and the entire corresponding half of the head appeared. Gathering in the tympanum, let out by paracentesis, took its regular course, with cicatrizations of the membrana tympani in the third week. Absence of pain in the ear and mastoid process, which were present in the entire corresponding half of the head, and even extended at times to the other side of the head without apparent cause. Diagnosis: neuralgia of the trigemini. Treatment: iodide of sodium internally and galvanization. After the second sitting, paresis of the abducens of the same side set in. Insomnia, anorexia, wasting away, and falling off of strength. No fever, no cerebral symptoms. In the ear and mastoid process nothing

of importance. From time to time, however, not until several months had elapsed, temporary symptoms of irritation in the mastoid region with simultaneous decrease of cephalalgia at every attack. After about eight months, opening of a subperiosteal abscess of the mastoid, which was found perforated by a fistula. Caries and suppuration at the bottom. Scraping, plugging, and antiseptic dressing. Recovery after six weeks. Since the operation, complete and definite disappearance of headaches, rapid improvement of paresis of abducens.

2. Professor POLITZER: **Ménière's Complex of Symptoms in Traumatic Lesion of the Labyrinth.** Demonstration of the histological examination.

The case occurred in a cobbler, aged twenty-one, who, on December 28, 1895, was struck upon the head by a mortar trough falling from a building in erection, whereupon he rapidly fell down, simultaneously losing his consciousness. The examination of the patient at the clinic of Professor KRAFFT-EBING, on January 17, 1896, discovered paralysis of the right facial nerve, paralysis of the right half of the velum palati, paralysis of taste in the right half of the tongue, staggering gait with tendency to fall toward the left, and defective intelligence.

Aural examinations, on January 24, 1896, showed bilateral retraction of the dull membranæ tympani and total deafness.

On January 31st diffuse headache, vomiting, and stupor suddenly appeared with high fever. Worse during the next few days; suppuration of the right middle ear simultaneously developed, with bulging of the right membrana tympani. Paracentesis with subsequent profuse otorrhœa does not influence the cerebral symptoms, and death ensued three days later under the symptoms of diffuse meningitis. A detailed account of the course of the disease up to the fatal issue was given by Dr. JOSEPH HIRSCHL.

The post-mortem revealed diffuse purulent meningitis, fracture of the base of the skull through both petrous bones, extending to the inner wall of the tympanum. Empyema of the sphenoidal cavity and both antra Highmori. Suppuration in the right tympanic cavity. The fissure through the pyramid ran bilaterally 2 mm from behind the porus acusticus internus to the upper edge of the pyramid, and from there at the upper surface of the pyramid to the limit of the tegmen tympani. On the right side, the fracture ran vertically through the greater part of the

cochlea ; on the left side, through the lower cochlear turn. Bilateral hemorrhagic exudate in the cochlear space.

The microscopical examination of the decalcified labyrinth gives the following result on the right side : Both cochlear scalæ are filled in all turns with an exudation consisting partly of fine granules, partly of round cells ; at isolated places of the endostium, proliferation of nucleated connective tissue. The details of Corti's organ cannot be distinguished. The nerve tracts of the modiolus, the spiral plate, and spiral ganglion are imbued with a minutely granular substance and granular cells. The same patches of exudation as in the cochlea are found in the utricle, ampullæ, and semicircular canals. Upon the external surface of the membranous ampullæ and semicircular canals, newly-formed nucleated connective tissue is rapidly developing.

In the left labyrinth a scantier exudation is deposited than in the right. On the other hand, the scala tympani of the first cochlear turn exhibits a delicate reticular new-formation of connective tissue, containing numerous spindle-cells, nuclei, and, in addition, interspersed migratory cells. Proliferations of newly formed connective tissue of the endostium are found also in the second cochlear turn and in the cupula. Corti's organ cannot be recognized on account of extensive proliferation of epithelium. The nerve tracts of the ramus cochleæ present the same changes as on the right side. In the vestibule, the ampullæ and semicircular canals, isolated places of the endostium are thickened. The membranous structures of the vestibule and the semicircular canals are but slightly altered.

In the epicrisis of the case, POLITZER holds that the total deafness and Ménière's complex of symptoms are sufficiently explained by the result of the anatomical examination. The empyema of the sphenoidal and maxillary cavities, and the suppuration of the right middle ear are undoubtedly the consequence of the suppuration of the pharyngeal structures produced by the fracture at the base of the skull. With reference to the origin of the meningitis of this case, it could not be definitely settled whether it was the consequence of the empyema of the sphenoidal cavity or of the suppurative otitis media, or of a lesion of the meninges which could macroscopically not be ascertained. The intense inflammatory new-formation of connective tissue, five weeks after the injury, is histologically of especial interest.

The paper was illustrated by a number of large charcoal drawings and by demonstrations of the histological specimens.

3. PROFESSOR GRUBER.—Contributions to the Study of the Otitic Intracranial Affections.

The lecturer had perused 40,073 records of autopsies with reference to the occurrence of otitic intracranial affections.

1806 corpses (1242 males, 564 females)—viz., 4.5 %—presented as the cause of death one or more inflammatory intracranial affections.

Intracranial otitic sequelæ were found in 232 corpses (163 males, 69 females)—viz., 12.8 %, considering the total number of 1806 intracranial affections, and 0.58 % in proportion with the total number of autopsies (40,073). Among these 232 cases, 81 autopsies were furnished by aurists; the remaining cases were taken from the surgical and internal clinics, viz., 34.91 % by aurists and 65.09 % by clinicists and surgeons.

The aural affection was found :

In the right ear.....	118 times	=	50.87 %
In the left ear.....	103 "	=	44.39 %
In both ears.....	6 "	=	2.59 %
Not recorded	5 "	=	2.15 %

Intracranial, secondary inflammations occurred with simple otitis media suppurativa, without caries, 65 times (44 males, 21 females) = 28 %, consequently 167 cases complicated with caries (128 males, 39 females) = 72 %.

The number of autopsies without caries and with sinus thrombosis was 42 (24 with solid, 18 with purulent, thrombi); the number of autopsies with caries and sinus-thrombosis was 106 (64 with solid and 42 with purulent thrombi).

The sigmoid and lateral sinuses were most frequently thrombosed, viz., in the 42 cases without caries, 24 times; in the 106 cases with caries, 73 times (73 males and 24 females).

In the simple otitic affections without thrombus in the sinus, there was found :

Meningitis.....	31 times	=	13 % (21 m., 10 fem.)
Cerebral abscess.....	19 "	=	8.2 % (14 m., 5 fem.)
Cerebellar abscess....	Once	=	0.4 % (1 female)

In the simple otitic affections with thrombus in one sinus, there was found :

Meningitis.....	12 times	(7 m., 5. fem.)	=	5.5 %
Cerebral abscess.....	Twice	(2 males)	=	0.8 %

In the cases with caries of the temporal bone, without sinus-thrombosis, there was found :

Meningitis.....	40 times	(34 m., 6 fem.)	= 17 %
Cerebral abscess.....	13	" (12 m., 1 fem.)	= 5.6 %
Cerebellar abscess	12	" (8 m., 4 fem.)	= 5.5 %

In the cases with caries and thrombosis there was found :

Meningitis	21 times	(17 m., 4 fem.)	= 9 %
Cerebral abscess.....	7	" (6 m., 1 fem.)	= 3 %
Cerebellar abscess....	4	" (2 m., 2 fem.)	= 1.6 %
Meningitis, with cholesteatoma.....	8	" (6 m., 2 fem.)	= 3.2 %

Among the patients with caries of the temporal bone, but without sinus-thrombosis, 16 (11 males, 5 females), = 6.8 %, and among those with caries and thrombosis, 32 (22 males, 10 females), had succumbed to pyæmic processes.

4. PROFESSOR POLITZER.—**Contribution to the Operative Exposure of the Middle-Ear Cavities.**

The number of operations performed by POLITZER, at his clinic and in private practice, for exposure of the middle-ear cavities comprised 53 cases.

In 13 cases the middle-ear spaces were laid bare in patients in whom previously the typical operation according to Schwartz had been made by Politzer, and relapses had occurred with persistent suppuration.

In 8 cases, in addition to profuse offensive otorrhœa with granulations or cholesteatoma in the tympanic cavity, the mastoid process was painful, without swelling of the external integument ; in 12 cases the painfulness was associated with swelling of the skin and of the periosteum of the mastoid. In 11 cases subperiosteal abscesses were found upon the mastoid, its walls being lined with granulations, and among these, in 7 cases, with a fistulous opening leading into the interior of the mastoid, and in 4 cases, without fistula.

Open fistulæ, with spontaneous perforation of the cortex, were found in 8 cases in the mastoid, and in 5 cases in the posterior and upper wall of the external meatus, through which the probe entered the antrum or a cavity in the mastoid filled with granulations.

Extreme stenosis of the external meatus by hyperostosis of the osseous portion, and hypertrophy of the lining of the external meatus, which could not be reduced, existed in 7 cases.

In 15 cases, in addition to the local pain in the ear or in the mastoid, headache, fever, occasional insomnia, vertigo, and nausea existed. Six cases with facial paralysis of long or short duration were operated, among which were 3 with tuberculous caries of the mastoid and of the tympanic cavity, with and without the formation of sequestra.

After description of the method of operation and its modification dependent upon the pathological changes in the temporal bone, Politzer reviews the changes found by him in exposing the middle-ear cavities.

In well-nigh one half of the cases, cholesteatomatous products were found in the tympanic cavity, antrum, and mastoid process. In 14 cases, he entered immediately below the cortex a spacious cavity in the mastoid with simultaneous carious and necrotic defects at the posterior and upper wall of the external meatus. The cavity was filled with discolored granulations, bone fragments, or dirty, cheesy masses. In 3 cases, the posterior and upper wall of the external osseous meatus was entirely missing; in 5 cases, the mastoid and the postero-superior wall of the canal were intensely sclerosed. The lateral sinus was laid bare to a varying extent in 4 cases by the suppurative process. In 3 cases, the dura mater was freely exposed, once above the mastoid antrum and twice above the tegmen tympani.

In the majority of cases, the antrum and walls of the tympanic cavity were diseased; malleus and incus in most cases defective. Politzer, therefore, during the last few years, operates mostly according to Küster's method. The typical opening, according to Schwartze, is advisable in cases with comparatively large hearing distance, which may be interfered with by the exposure of the middle-ear spaces and removal of malleus and incus.

Among the accidents during the operation, Politzer mentions intense hemorrhages from granulations and bone vessels or from an emissarium Santorini, which are readily stopped by plugging. In 1 case, the dura mater was laid bare without any consequences to the healing process. In 1 case, the horizontal portion of the facial nerve was injured by the sharp spoon scraping out the attic. This paresis of the facial disappeared in the course of several months. In 2 cases with facial paralysis before the

operation, the nerve recovered completely after the operation. The horizontal semicircular canal was not injured in any case.

Plastic procedures varied according to the anatomical relations of the special case. Most frequently the posterior cartilagino-membranous wall of the external meatus was divided in its entire length into two flaps, and, in order to gain a canal as wide as possible, one flap was sewed upward to the outer cutis, and the other downward. In several instances Koerner's flaps and also Thiersch's transplantations were used with good result. In cases with granulations in the middle ear and with small cholesteatomatous cavities in the antrum, Politzer permits the operated wound behind the auricle to close by cicatrization; in those with large cholesteatomatous cavities in the mastoid, it is necessary, on account of the better inspection of the focus of the disease, and of the possibility of better cleansing, to let the opening in the mastoid persist.

With reference to the final results of the operative exposure of the middle-ear cavities, Politzer believes, that the statements of various surgeons upon the cure of otorrhœa after this operation (50 to 75 %) are entirely too optimistic, since the duration of observation is, on the whole, still too brief, and some cases have been observed in which relapse of suppuration occurred after two and three years. Cholesteatomata relapse, as is well known, with but rare exceptions. The designation as radical operation, therefore, is, according to Politzer, not quite correct. Among the cases operated by Politzer, the suppuration has entirely ceased in 17 cases for a long period, while the remaining cases are still under observation. Secondary operations were performed in 7 cases. In 1 case, the external meatus was stenosed. While the duration of treatment is generally briefer than by typical opening of the mastoid, it still lasts several months. The hearing power was mostly somewhat improved by the operation, but rarely impaired. After this, as well as after the typical opening of the mastoid, the annoying symptoms from the head were relieved by the operation, and the general condition was improved. Exitus letalis was observed in 6 cases, viz.: in 3 cases with pyæmia, present previous to the operation; in 2 cases with chronic tuberculous otitis; and in 1 case with brain abscess, which had existed before the operation, but had not presented any symptoms.

5. Professor URBANTSCHITSCH. — Contribution to the Operative Exposure of the Middle Ear.

URBANTSCHITSCH has, during the last two years, performed the so-called radical operation of the middle ear in 72 cases. Among these were 47 cases with pure caries, 13 with carious and cholesteatomatous foci, and 12 cases with pure cholesteatoma.

In 42 cases the *mastoid antrum* did not present any marked alterations of its size ; in 12 cases it appeared abnormally small, in 18 abnormally large, and among these were 5 with enormous enlargement posteriorly. The latter were cholesteatomata.

Urbantschitsch holds that the enlargement of the mastoid antrum reduces the size of the cavity of the skull.

Among the 72 cases the disease had extended in 9 cases to the *dura mater* (in 6 cases to the cerebellum, in 3 above the tegmen tympani). In 1 case, the *dura mater* above the tegmen tympani was perforated and *portions of brain* were prolapsed into the attic ; this case completely recovered. Urbantschitsch mentions another case, in which the irrigated solutions contained upon their return brain matter, which, as seen during the operation, originated from the cerebellum. The portions had entered a large cholesteatomatous cavity of the mastoid process, which had penetrated into the external meatus ; this case also recovered.

The *lateral sinus* was frequently found to be exposed ; in 1 case, almost in its entire extent up to the transition into the *bulbus venæ jugularis* ; in many cases the sinus was laid bare by operation. In 1 case Urbantschitsch found the sinus after opening without blood, but inferiorly thrombosed.

The *malleus* and *incus* were found as follows : Among the 72 cases the malleus was found normal 8, carious 62 times, twice missing ; the incus normal 6, carious 63, missing 3 times ; in 2 cases of caries an osseous adhesion of both ossicles was found.

The *facial nerve* was found before the operation in one case completely paralyzed, in several cases paretic. The paresis rapidly recovered after operation ; the paralysis was greatly improved. During the operation facial paresis occurred in no case, but six times one or two days after operation with subsequent recovery ; in 1 case the facial paresis of the upper lid became spastic.

Urbantschitsch then discusses the method of operation used by him and the after treatment.

Owing to the brevity of observation, which to the utmost

lasted two years, Urbantschitsch cannot make any definite statement with reference to the final results of the treatment, but only communicates the *course* of the cases up to date: Among the 72 cases, 28 heretofore resulted in a completely dry cavity, viz., 13 cases within 6 to 12 weeks, 8 within 3 to 4 months, 4 cases in 5 to 6 months, and 1 of each in 7, 12, and 16 months, respectively.

The operation markedly benefited the symptoms of *headache, vertigo, nausea*, etc., and the entire general health. Among the 72 cases, 42 had such symptoms, and one of them was a cholesteatoma with atrophy of the optic nerve and considerable contraction of the field of vision, which markedly improved after operation. Urbantschitsch, furthermore, emphasizes the beneficial influence of the operation upon psychic and nutritive disturbances, and also upon the *function of hearing* which was in some instances considerably improved (cp. Cases 2, 5, 7).

Urbantschitsch lays stress upon the fact, that frequently only by exposure of the middle-ear cavities, the extreme danger which threatens the life of the patient can be recognized.

6. Dr. FERDINAND ALT.—Apoplectiform Diseases of the Labyrinth in Caisson Laborers.

In caisson workers, exposed to pressures of 2.5 atmospheres, 3 cases of severe disease were observed. They occurred in 3 men who worked under over-pressure of from 2.2 to 2.4 atmospheres during the regulated time of four hours and then left the caisson feeling perfectly well. In one man, after an hour, in the other after 35 minutes, in the third after an hour and a half, the typical symptoms of morbus Ménière occurred, with well-nigh complete deafness, and so persistent and extreme vertigo, as rendering the patients unable to stand and necessitating their admission to Schroeter's clinic. In all three men extreme retraction and more or less marked livid discoloration of the drum-membrane with injection of the vessels of the malleus were seen; the result of the examination with tuning-forks had to be interpreted as a bilateral affection of the labyrinth. In two of the men there existed complete deafness in the left, in the third in the right ear, which persisted, while in the other ear slight traces of hearing power were preserved, which considerably improved in a few days.

ALT explains the later development of the severe affections, which do not occur in the caisson itself, but some time after leaving it, by fluctuations of the blood pressure, the curves of which he demonstrates. The causes of these cases are purely

mechanical, due to difference of pressure in the middle-ear and the surrounding cavities.

7. Dr. JOSEF POLLAK reports a case of Perichondritis Septi Narium Serosa.

In a man aged fifty-three complete obstruction of the nose had taken place without any apparent cause. The nasal entrance was filled with two pale red tumors. A swelling upon the dorsum nasalis, of the size of a hazel-nut, discharged, upon incision, serous fluid. After galvano-caustic extensive opening of one of the tumors, the cartilag quadrangularis was found to be perforated by a fissure.

POLLAK believes, that the affection is caused by degeneration of the cartilage, similar to othæmatoma.

8. Dr. GOMPERZ: Typical Alterations of the Tension of the Membrana Tympani in Valvular Occlusions of the Eustachian Tubes.

GOMPERZ draws attention to the bulgings of the *postero-superior quadrant* which are occasionally observed in an otherwise normal membrana tympani and intact apparatus of the tympanic cavity.

The patients exhibiting this anomaly have mostly slight disturbances, consisting in sensations of pressure, tension, slight subjective noises and occasional deafness.

The result of the examination with Siegle's otoscope is characteristic. The postero-superior portion promptly follows the compressions and rarefactions of the air in the external meatus, but immediately jerks into its former bulged position, even after the last movement has been a compression of air.

The patients state that even during the most precautions blowing of the nose, they feel the air striking against the membrana tympani.

There cannot, therefore, exist an impediment to its entrance into the tympanic cavity, but certainly one to its exit. In the cases, whose naso-pharynx had been examined, catarrh of this cavity, hypertrophy of the mucous membrane, polypi, and suppurations of the accessory sinuses were found.

Gomperz could remove this annoying abnormality by treatment of the naso-pharyngeal affection either alone, or together with catheterization and probing.

9. Dr. GOMPERZ: Studies upon the Possibility of Closing Old Defects of the Membrana Tympani.

Gomperz has subjected Okuneff's results to a critical parallel examination in trying the cauterization of the margins of a

number of chronic perforations of the membrana tympani with trichloracetic acid. The results were extremely gratifying, since in four among ten cases, after a few cauterizations, the defects cicatrized and even in one occupying the entire lower half of the drum membrane up to the periphery, while the size of the remaining six perforations considerably decreased. Gomperz cauterizes after application of a ten per cent. solution of cocaine with a thin probe, winding around the end a few threads of cotton impregnated with fluid trichloracetic acid.

The procedure is painful, but well borne. It can, of course, be applied only to cases in which by previous experiments with artificial drum membranes an impairment of hearing is not to be feared. The appearance of the cicatrized membrane is of particular interest to Gomperz : in place of the perforations a gray, firm, dull membrane had joined the remaining drum membrane without marked limits, which condition favors his former views of the simultaneous regeneration of the substantia propria in the cicatrization.

Gomperz does not believe that trichloracetic acid alone favors cicatrization. The brief duration of treatment accounts for the delay of the cure of the remaining six cases ; the other cured cases present considerable improvement of hearing, and in one the annoying subjective noises disappeared with the closing of the perforation after two years' duration.

10. DR. HAMMERSCHLAG : Respiratory and Pulsatory Movements of the Drum Membrane.

HAMMERSCHLAG made his investigations with an especial instrument devised by him similarly to that of Mach. He made about thirty observations upon four young normal-hearing individuals with the following results :

The membrana tympani exhibits constant movements coincident with the systole of the heart.

The membrana tympani moved during quiet respiration in all cases during the inspiration outwardly, during the expiration inwardly. During quiet respiration through the mouth these respiratory movements are less extensive.

Hammerschlag, therefore, arrives at the following conclusions :

The tympanic cavity openly communicates in the normal state with the naso-pharyngeal cavity.

The expiratory air current draws the air along from the tube

and the tympanic cavity according to the principle of the syphon, whereby the drum membrane is moved inwardly.

The inspiratory air current then enters the tympanic cavity so much easier, since it now represents a *locus minoris resistentiæ*. Hammerschlag considers Politzer's observations which are somewhat at variance with his own, as extremely suggestive of further more extensive investigations which may in future succeed in solving the still existing contradictions.

The pulsatory movements have before been explained by other authors through the reduction of the lumen of the tympanic cavity with each systole, whereby the drum membrane moves outwardly. Hammerschlag cannot add another proof to this entirely correct view.

REPORT ON THE FOURTH MEETING OF THE
DUTCH LARYNGO-RHINO-OTOLOGICAL SO-
CIETY, HELD AT UTRECHT, ON MAY 17, 1896.

BY PROFESSOR GUYE, OF AMSTERDAM.

Translated by Dr. MAX TOEPLITZ.

President : PROFESSOR GUYE.

1. Dr. HUYSMAN.—Case of Perforations in Both Anterior Pillars of the Fauces.

The patient, a young man, aged twenty, had suffered as a child from scarlet fever, with subsequent persistent bilateral chronic perforations of the drum membranes. HUYSMAN, nevertheless, considers the condition as a congenital anomaly, principally on account of the symmetrical position of both oval defects.

2. Dr. M. BOLT.—Percussion of the Mastoid.

In two cases of acute otitis media with delayed spontaneous perforation of the drum membrane and moderate inflammation of the mastoid region, BOLT found, in percussion, marked dullness, thereupon indicating the mastoid operation, which was not permitted. After paracentesis of the membrana tympani, both cases completely recovered without further operation.

3. Professor GUYE.—Demonstration of a Case of Radical Operation on Account of Cholesteatoma.

The patient, a school-teacher, aged thirty-nine, was, twenty years ago, in 1875, treated by GUYE for purulent otitis media with polypi and abscess over the mastoid process. In 1888, the patient stated, that after six years of perfect health, he had twice subjected himself, on account of headaches and neurasthenia, to cold-water treatment without improvement, but now again suffered from earache and otorrhœa. Some granulations and offen-

sive cheesy pus were removed from the tympanic cavity and antrum. Irrigations were made through the tympanic cavity from the Eustachian tube. After several repetitions of this treatment, the patient remained perfectly well for one year. He returned in 1889 and 1890 with slight relapses, remained very well from 1890 until 1896, syringing the ear once a month with a 1:000 solution of sublimate, and had all this time neither earaches nor otorrhœa. On March 21, 1896, he returned with pain and otorrhœa. After removal of a large amount of epidermis, a spontaneous perforation was found in the posterior wall of the external meatus, from which many pieces of epidermis were removed. Three weeks later the patient returned after an attack of influenza, with renewed pain and swelling of the mastoid. On April 18th, an abscess was found above the external meatus. On the following day the operation took place. Guye found a very large antrum, filled with pus and cholesteatomatous masses. After their removal, air bubbles could, upon Valsalva's experiment, be seen to come out of the *aditus ad antrum*. Guye resolved to make a permanent opening, and introduced, three days after the operation, a rubber drainage tube, 12 *mm* in thickness and 3 *cm* long, cut off in such a way as to make it at two places extend to the posterior wall of the antrum; in addition, he placed a strip of iodoformed gauze through the opening in the posterior wall of the external meatus, leading it through the outer opening in the mastoid. He thus intended to keep this spontaneous perforation, which was still more enlarged during the operation, permanently open. The drainage tube, of course, was shortened after a few days to 2 *cm*. The patient is still able to blow the air through both openings. Guye will let the canal cuticize, and, after a few months, replace the drainage tube by a loose plug of iodoformed gauze, and keep the canal as dry as possible. Four years ago, Guye had presented before this society a patient operated by him according to the same method, who has had for eight years these two permanent openings without a trace of relapse. He now and then expresses the desire of having the opening closed, which I do not, of course, grant, because it would sooner or later create a relapse.

4. Dr. MOLL.—A Case of Chiselling of the Mastoid.

The patient, a man aged thirty, had suffered in his childhood from otorrhœa, and, for two years, from violent headache. There existed some otorrhœa and swelling of the mastoid. MOLL

opened the mastoid by chiselling, removed a great amount of cheesy pus, and transplanted the outer skin in order to keep the wound open. At the bottom of the wound, an osseous bridge, below which a probe can be passed, impresses us as a semi-circular canal, but neither Dr. MOLL nor any one of the other aurists present believe it. The headaches have disappeared, and the general condition of the patient is satisfactory.

5. Dr. REINHARD (of Duisburg, as guest of the society). Presentation of a patient with **Deep-Seated Cervical Abscess Following Otitis Media Purulenta.**

The peculiar feature was the development of the abscess after the otitis media had taken its course. There existed a very large and hard infiltration, non-fluctuating and extending to the clavicle and manubrium sterni. On March 25th the mastoid process was chiselled and found to contain in the planum mastoideum a perforation, the size of a pea, from which yellow non-offensive pus was discharged. The burrowing abscess was incised and drained on April 10th and again on the 23d. There still exists posteriorly a hard infiltration, and granulations at the bottom.

Dr. TEN LEITHOFF asks, whether the pus has been microscopically examined. The hard infiltration extending from the mastoid process to the clavicle leads him to the supposition of the presence of actinomyces. A year ago he had located a similar case in which the hard infiltration and the absence of fluctuation led him to the diagnosis of actinomyces, which he really found as granules in the pus and cured in a few weeks with iodide of potassium in doses of 2 grammes per diem.

(In the course of the meeting TEN LEITHOFF with permission of REINHARD examined the pus taken from the wound and demonstrated to the members the clubs and threads of actinomyces, which were considered to be proven as such by several aurists. REINHARD states that the diagnosis of actinomyces appeared to him quite probable but not absolutely established.)

6. Dr. W. VAN DER HEIDE. Demonstration of **Choanal Polypi and Foreign Bodies.**

VAN DER HEIDE presents four large choanal polypi which had been removed with the cold snare. One was a cysto-fibroma; three were removed through the nose, one through the mouth, after the thin pedicle had been severed by the snare.

He also demonstrated a revolver bullet which had been shot by a suicide into the inner canthus. The bullet could neither be

found in the wound, nor in the abscess of the inner canthus. After a few weeks the left nostril was obstructed by offensive discharge. In introducing a probe between the middle turbinal and septum, Van der Heide felt a foreign body, which when extracted with curved forceps proved to be the extremely disfigured bullet. A few days later an osseous sequestrum was removed.

Van der Heide furthermore exhibited a centipede, which, five years ago, had during sleep crawled into a boy's nose. The patient suffered from headache and itching in the nose. A week after the removal of adenoid vegetations, the patient returned with a mucous mass, which had been removed a few days after the operation, by nasal irrigations, and presented lively movements. After cleaning, it proved to be an insect which was determined by Dr. P. P. C. Hoek as *anthronomalus similis*.

7. DR. A. SIKKEL. Demonstration of **Plaster of Paris Casts of the Upper Jaws in Adenoid Vegetations.**

These casts present the peculiar changes to which in 1891 Koerner drew attention, and which differ according to Sikkel according to the development of the nasal obstructions during the first or second dentition. In the first case, the hard palate is high, the entire upper jaw not well developed, the transverse diameter shortened, the longitudinal prolonged. In the second case, the following changes are added: The hard palate is still higher, the alveolar processes are nearer together, and the jaw is apparently laterally compressed. There exists a sharp bend in the median line, the two median incisors are placed at an angle and turn the lingual surfaces toward one another. The lateral incisors also seem to suffer from the nasal obstruction; in some cases, one is atrophied and the other entirely missing. It would be advisable for dentists to pay attention to the fact, that the crooked and irregular growth of teeth is frequently due to changes in the upper jaw caused by nasal obstruction.

8. DR. H. BURGER. Demonstration of a case of **Radical Operation with Persistent Opening on Account of Cholesteatoma.**

The patient, a man, aged twenty-seven, came, four years ago, under observation with offensive discharge from the right ear, of fourteen years' duration, frequent vertigo, and headache. After the removal of a large amount of cholesteatomatous masses, a portion of the upper and posterior wall of the external meatus was

seen to be missing, a defect which led into a large cavity in the mastoid process, containing many offensive masses, which were removed. After cessation of headache and vertigo, the patient escaped further treatment, but returned three years later, in December, 1895, with the complaint, that during the last six months headache and vertiginous attacks had reappeared, and once even with loss of consciousness, diplopia, and convulsions. The patient, on December 24, 1895, was operated in narcosis, with removal of the remaining osseous posterior wall of the external meatus and the formation of a cutaneous flap according to Stacke-Jansen. On March 5, 1896, the cavity in the mastoid process was entirely cutized without a trace of secretion. The general health, appearance, and memory, which had been very poor during the last year, were much improved, and also the hearing for whispered voice had increased from 0.50 metres to 2.50 metres.

REINHARD is struck with the complete occlusion of the tube, which, according to Burger's statement, has not been intentionally effected. He has frequently tried during operation to produce the occlusion either by curetting or cauterization, but always to no purpose. He considers this occlusion as a very fortunate feature.

GUYE believes it to be advantageous, if the tube remains open, for the normal ventilation of the tympanic cavity.

BURGER, in accordance with Reinhard, considers the occlusion as an advantage principally in cholesteatoma, in which relapses frequently take place by inflammatory irritation from the tube. The ventilation through the tube is of no service after the radical operation, when membrana tympani and posterior wall of external meatus are absent.

M. BOLT. Treatment of Chronic Purulent Otitis Media with Styron.

Bolt used a 5-per-cent. alcoholic solution of styron (recommended by Spalding), and was very well satisfied with its action. Styron is a mixture of equal parts of styrax and Peru-balsam.

REPORT ON THE PROGRESS OF OTOLOGY DURING THE SECOND QUARTER OF THE YEAR 1896.

BY DR. ARTHUR HARTMANN, BERLIN.

Translated by Dr. C. ZIMMERMANN, Milwaukee, Wis.

A.—ANATOMY.

a.—EAR.

134. BRIEGER, OSCAR. Clinical contributions to otology. Wiesbaden, J. F. Bergmann.

135. GARNAULT, P., Paris. May, from formations of the skull, conclusions be drawn as to anatomical conditions presenting more or less danger in operations on the temporal bone? Paris, A. Maloine, 1896.

136. SCHUELZKE. On the topographic anatomy of the ear in regard to the formation of the skull. *Arch. f. Ohrenheilk.*, vol. xl, Nos. 3 and 4.

137. RAMÓN Y CAJAL, S. Contributions to the study of the medulla oblongata, the cerebellum, and the origin of the cranial nerves. German edition, with additions by the author, by Johannes Bresler. With a preface by E. Mendel. Leipzig, 1896, Joh. Ambr. Barth.

138. MEYER, S. On a fashion of connection of the neurons; with communications on the technique and the results of the method of subcutaneous injections of methylene blue. *Arch. f. mikrosk. Anat. und Entwicklungsgeschichte*, vol. xlvii., 1896.

139. DOWNIE, WALKER. A case of congenital malformation of the ears. *The Practitioner*, March, 1896.

140. TALBOT, EUGEN S. The degenerated ear. *Amer. Med. Assoc.*, Jan. 18, 1896.

141. ALEXANDER, GUSTAV, WIEN. Contribution to the macroscopical dissection of the human labyrinth. (From the anatomical institute of Professor Zuckerkandl.) *Arch. f. Anat. und Physiologie*, 1893. Anat. Abth.

134. During the years 1892-94, BRIEGER observed 11 cases of malformation of the external ear, of which 5 presented microtia, which occurred on both sides in 3 cases; atresia of the external auditory canal in 2 cases; the auricle was pretty normally developed. Bilateral microtia is not very rare, according to Brieger. In all cases of unilateral microtia there was marked asymmetry of the face. In one case the auditory canal was divided into an upper portion extending to the *Mt*, and a lower one, ending blind. Auricular appendages occurred frequently; excessive growth of the auricle only once.

135. Koerner's researches in regard to the lower level of the middle cranial fossa and the more anterior portion of the sinus in brachycephalous skulls were repeated by GARNAULT, but not, as Garnault thinks, with contradictory results. Garnault measured 60 skulls stereographically, according to Broca's method—27 dolichocephalous, 26 brachycephalous, 7 mesaticephalous. As to the relation of the linea temporalis to the middle cranial fossa, so many variations occurred, independent of the external configuration of the skull, that the linea temporalis has no diagnostic value. Without exception, its position was lower in females. In brachycephalous skulls the middle cranial fossa is, in the average, lower than the linea temporalis and the horizontal tangent. This corroborates Koerner's assertions. Garnault, however, is of opinion that the variations are too small, of irregular graduations, and mostly dependent upon individual relations, so that they do not admit of formulating a general law. Garnault avers the same in regard to the topography of the lateral sinus. The left sinus was constantly found farther back, 1.55 mm at an average. At the most, it might be inferred that the right sinus in the brachycephalous advanced minimally, but in regular progression. Often such an advancement of the sinus was found when the mastoid process was little developed and diploic or compact (Politzer). Garnault's assertions culminate in the admonition to consider every petrous bone, especially that of the right side, as dangerous in regard to operations.

G. ZIMMERMANN.

136. SCHUELZKE criticises the methods of Koerner (described in *Archiv f. Ohrenh.*, vol. xxiv., and these ARCHIVES, German edition, vols. xviii, 310 ; xvi., 281, and xxi., 431), and tries to prove the wrong in Koerner's conclusions by means of tables compiled by Koerner, Randall, Garnault, and himself. He concludes that there are no external signs of the so-called dangerous petrous bones, "since the level of the middle cranial fossa and the advancement of the sinus are not dependent upon anthropological types." The floor of the middle cranial fossa of each side is not at the same level, and the right sinus generally penetrates farther into the bone and produces more frequently the dangerous form than the left.

KRAUSE.

137. In a very elaborate monograph the well known Spanish author collects his recent researches on the medulla oblongata by means of his silver chromate method. He confirms the recent investigations of Koelliker, von Lenhossek, and Held, in regard to the origin of the vestibular and cochlear nerves. A minute description is given of the bifurcation of the vestibular fibres and of the nucleus of Deiters, of Bechterew, and the dorsal nucleus. RAMÓN Y CAJAL discovered a new acoustic focus in front of the convexity of the upper olive, and called it nucleus semilunaris sive præolivaris externus. The terminal fibres in the nucleus of the corpus trapezoides, discovered by Held, are described in detail by Ramón y Cajal. In opposition to Held's opinion, they represent either direct acoustic fibres or nervous processes of the ventral nucleus.

KRAUSE.

138. MEYER also succeeded in obtaining those terminal fibres in the nucleus trapezoides with the method of subcutaneous injections of methylene blue and the slow method of Golgi, but they give pictures different from those of Ramón y Cajal and Held. The generally pretty thick fibre spreads its several branches into numerous round or oblong swellings encircling very closely the body of the ganglion cell. The reporter found the same pictures in numerous similar experiments, and corroborates the results obtained by Meyer. This object shows most decidedly the superiority of the staining method with methylene blue over that of Golgi.

KRAUSE.

139. In DOWNIE's case the right auricle was fully developed, but springing from the site of the tragus was another miniature auricle with its helix directed forwards, consisting of skin and fat, with a small portion of cartilage on its inner aspect, a deep

depression being present in front. The meatus was slit-like, the membrane normal. The left auricle was represented by a mass of soft tissue, irregular in shape, and deficient in cartilage; the helix represented by two curves as if the posterior border at its most prominent part had been pushed forward; the concha merely a linear depression, and at the upper part of that which represented the lobule was a small circular depression confined to the skin only. No sign of meatus to be detected. The mouth was kept widely open, the lower lip presenting a V-shaped outline. Under the tongue a large mass of tissue was present which interfered with deglutition and respiration. The child died about six weeks old of exhaustion, and at the post-mortem examination no sign of a meatus could be found on the left side, the bone being rounded in front, with absence of the zygomatic process. Lying between the skin and bone was a pad of what looked like embryonic tissue. A complete examination was not allowed.

CHEATLE.

140. The writer says that "comparison of the length and width of the ears of paupers, criminals, and the insane indicate that degenerates possessed much the largest and widest ears." He gives a table, in which it is shown that the percentage of deformities of criminals and insane is nearly the same, and, taken together, is about one half as great as the normal. In an examination of 1000 normal persons—92 per cent. were found to have attached lobules, while among the insane only 47 per cent. were found, showing that the former theory was not correct, viz., "that persons whose lobule is attached its entire length have insane tendencies." The tables show that the tubercle of Darwin is not always found at the upper part of the middle third of the helix. Tubercles practically identical may be found at any point on its border. These tubercles are obviously similar in appearance, and due to the same causes that produce the tubercle of Darwin (arrest, and excessive development of the helix). There is a larger percentage among normal individuals than with the degenerate class. The left ear seems to be least affected in either the normal or the degenerate. The ear at 90 degrees is said to be a marked sign of degeneracy, yet the figures do not bear out this claim.

GORHAM BACON.

141. After discussing the usual methods for dissection of the labyrinth, ALEXANDER describes his methods of decalcination and hardening. He recommends chiefly the method with chromic

and hydrochloric acids on account of its short duration and cheapness, the certainty of complete decalcination, and the marked differentiation of colors. The details have to be read in the original. The author makes systematic anatomical preparations for the demonstration of various portions of the labyrinth (*e. g.*, a semicircular canal or utriculus vestibuli), which he leaves in connection with the bone for orientation. Also topographic anatomical preparations of the membranous labyrinth of the upper or posterior surface of the petrous bone, or the fenestra vestibularis and the three semicircular canals with the oval utriculus. The illustrations show very well the value of these preparations.

WALTER HAENEL.

b.—NOSE AND PHARYNX.

142. DUNCAN W. and DAWREN A. Case of congenital absence of nose, right palpebral fissure, right ear, etc. *Trans. Gyn. Society of London*, v., 37, p. 16.

143. LIEBE, G. Congenital atresia of the nostrils. *Monatschrift f. Ohrenheilkunde*, Jahrg. xxx., 4.

144. DOWNIE, WALKER. Congenital membranous occlusion of left nostril. *Brit. Med. Jour.*, May 16, 1896.

145. KILLIAN, G. On the anatomy of the nose of human embryos. *Arch. f. Laryng. and Rhin.*, vol. iv., No. 1.

146. SEYDEL, O. On the nasal cavity and Jacobson's organ in amphibia. *Morphol. Jahrbuch*, vol. xxiii., No. 4.

142. DUNCAN reports a total osseous atresia of the right choana of a girl æt. nine, with homonymous paresis of the muscles of the face, which he attributes to inactivity of the muscles effecting nasal respiration.

KRUASE.

143. A case of congenital partial occlusion of the nostrils of a patient, aged eighteen, who had suffered from a high degree of rachitis in childhood. Each nostril presents a funnel-shaped cavity with an opening at the apex of the size of a pin's head. The obstruction is membranous. Position of teeth abnormal. The upper row of teeth recedes behind the lower. LIEBE attributes the maxillary, deformation to the wanting nasal respiration.

KRAUSE.

144. At the Glasgow Medico-Chirurgical Society, May 8th. DOWNIE showed a child aged twelve months with a membrane stretching across and occluding the left nostril.

145. In the second part of his voluminous work KILLIAN describes in detail the cartilages and bones of the lateral ethmoidal region according to Born's method. He reaches the conclusion, that the cartilaginous and osseous turbinated bodies belong to the same type of architecture and are to be considered as lamellæ, save the ascending process of the first concha. Their size decreases in a ventro-dorsal direction and one covers the other like shingles. The second chief turbinated body shows this type best. It originates from the middle portion of the lamina papyracea, and from a medial aspect presents an ascending and descending portion. The former is attached to the corresponding portion of the next concha by secondary union. The additional conchæ are built in the same fashion, only in smaller proportions, so that the whole ethmoidal region may be considered as a large lamella of the lateral lamella, from which numerous small lamellæ arise in regular arrangement. The ascending branches of the six sulci, always present at first, close up later; the fifth and sixth obliterate, and from the others various combinations may result.

KRAUSE.

146. The amphibia are the lowest animals with the organ of Jacobson. SEYDEL examined it in some amphibia, in order to study its phylogenesis. It is to be considered as a differentiation of the nasal cavity and contains real sense-epithelium, provided by the olfactory nerve. It originates in a semicanalicular depression of the olfactory mucous membrane, which develops into different formations by separation, transportation, and extension to a cul-de-sac. Numerous well developed glands empty their secretion into this organ, which has the function to transmit the excitation of the nervous terminal organs and to remove foreign bodies from the diverticulum. A maxillary cavity analogous to that of the mammals is wanting in amphibia.

KRAUSE.

B.—PHYSIOLOGY.

147. EPSTEIN, S. On the modification of visual perceptions under the influence of simultaneous acoustic impressions. *Zeitschr. f. Biol.*, xxxiii., N. F., B. xv., 1896. p. 28.

148. GELLÉ. "Audition," *Dictionary of Physiology*, by Charles Richet, Paris, 1895.

147. EPSTEIN's paper is the first attempt to oppose the speculations on colored audition by experiments. He examined the increase of vision under the influence of simultaneous acoustic

impressions. The arrangement of the experiment carefully excluded many sources of error. The chief result of the 164 experiments was, that in 60 % the acoustic impressions acted not only on the modification of vision, but also on the color sense, in the remaining 40 % only on vision. He explains this by the assumption, that the acoustic excitation reaching the anterior corpora quadrigemina is reflected to those optic fibres which conduct in a centrifugal direction, so that the retina becomes more sensitive for visual perceptions. ASHER (Bern).

148. GELLÉ gives in his extensive work (83 pages), not only a complete description of the physiology of the hearing organ, but also a very minute anatomical sketch with many illustrations, including embryology and comparative anatomy.

C.—PATHOLOGY AND THERAPEUTICS.

MISCELLANEOUS.

149. Report on Gruber's polyclinic in 1895. *Monatsschr. f. Ohrenheilk.*, 1896, Nos. 4, 5, and 6.

150. NICOLAI e DELLA VEDOVA. Statistics and clinical considerations on laryngo-otology in 1896. Milano, 1895.

151. OTTOLENGHI. The condition of hereditary deaf-mutes in biology and in law. *Arch. italiano di Otologia*, etc., 1896. fasc. I., p. 1.

152. SUCHANNEK, H. On scrofulosis ; its pathology and relation to latent tuberculosis of the tonsils, cervical glands, and vicinity. *M. Bresgen's Sammlung zwangloser Abhandlungen*, etc., Halle, 1896, vol. i., No. 11.

153. HAGEDORN, M. On the relation of general diseases and affections of the nose and throat to the hearing organ. *M. Bresgen's Sammlung*, etc., vol. i., No. 10.

149. The report contains tables of all cases and the histories of the following: Malformation of the auricle, foreign bodies in the external meatus, otitis externa, eczema of the auricle, othæmatoma ; ruptures of *Mt*, sarcoma of the ear, otitis media hyperplastica ; chronic otitis media with caries of the mastoid process, pyæmia, inflammation of the wall of the sinus transversus and extradural abscess, operation, recovery ; 2 cases of opening of the mastoid process, speedy recovery by secondary suture.

G. KILLIAN.

150. NIKOLAI and DELLA VEDOVA, give statistics on 4393 patients : 1748 affections of the nose, 504 of the ear, 1008 of pharynx, 489 of larynx, 412 of throat, 32 of œsophagus. Each chapter contains a clinical summary of the more important diseases.

GRADENIGO.

151. OTTOLENGHI reports investigations on deaf-mutism from biological and legal standpoints. He collected the views held by various codes, describes the anthropological characteristics according to his own observations, the various symptoms of sensibility, the mental development of deaf-mutes, and comes to the conclusion that the latter, save that of deaf-mute cretins, is not much inferior to that of normal individuals. Legally the deaf-mute has the same rights as any other citizen. Each case has to be individualized, and the regulations in regard to persons with mental defects have also to be extended to deaf-mutes.

GRADENIGO.

152. SUCHANNEK's results may be thus formulated : Scrofulosis is tuberculosis and tubercle bacilli may be latent in the tonsils like anywhere else.

BLOCH.

INSTRUMENTS AND METHODS OF EXAMINATION.

154. FERRERI. Gymnastics of the *Mt* and ossicles. Description of a new apparatus. *Arch. italiano di Otolog.*, iv., 1896, p. 153.

155. COURTADE. Irrigation of the tympanic cavity with a new canula. *Ann. des mal. de l'oreille*, May, 1896.

156. EITELBERG, A., Vienna. On some accidents in catheterism and in introducing bougies into the Eustachian tube. *Wien. med. Presse*, No. 26, 1896.

157. OHLS, HENRY G. A simple method of transillumination. *Journ. Amer. Med. Assoc.*, June 13, 1896.

158. SCHWARTZ, WM., Rostock. On the value of electric transillumination of the cavities of the human body. *Beitrag für klin. Chirurgie*, vol. xiv., p. 615.

159. GIBB, JOSEPH P. A septal pin. *Phila. Polyclinic*, April 18, 1896.

160. KOHN, SAMUEL. Upon the importance of digital examination in the diagnosis and treatment of diseases of the throat and nose. *Medical Record*, April 18, 1896.

161. **BERGEAT**, H., München. On the visibility of the upper turbinated body in non-atrophic nasal cavities. *Monatsschr. f. Ohrenheilk.*, No. 6, 1896.

154. The instrument, described and illustrated by **FERRERI**, is for slow massage of *Mt* (not more than thirty vibrations per minute). It may be employed by the patient without danger for the sound-conducting apparatus, since the pressure used does not exceed 24 cm.

GRADENIGO.

155. **COURTADE**'s tympanic canula forms an angle with the handle, but there it is straight and has, next to its terminal opening, two lateral holes.

ZIMMERMANN.

156. **EITELBERG** observed intense submucous emphysema after a lesion of the mucous membrane by introducing a bougie into the Eustachian tube. It spread over the corresponding side of neck down to the chest and up to the cheek and forehead. In another case a celluloid bougie had remained in the isthmus of the tube, and after forced extraction the button was missing. No reaction, and as other bougies could be introduced without trouble, Eitelberg thinks that the button had been thrown out by reflex sneezing.

POLLAK.

157. **OHLS** uses an ordinary cautery electrode guarded by a two-drachm vial, which is held by the neck with the patient's lips, the cork preventing the light to escape. By covering the vial with opaque paper except at the end, it can be used for transillumination of the frontal sinus.

M. TOEPLITZ.

158. According to **SCHWARTZ** the transillumination of the frontal sinus from the orbit is very valuable for diagnostic purposes, since the absorption of light by pus is so intense, that the transillumination will yield a negative result even with small quantities of pus (*contra Ziem*). The absence of the frontal sinus, which might be misleading, is very rare. No observations of his own. He thinks that his method of transilluminating each maxillary sinus from its inferior (palatal) wall is much more reliable than the former methods. Only in 20 per cent. of his cases with normal maxillary sinus the pupil was illuminated. Therefore he considers this phenomenon as unimportant. The result of transillumination will be negative in empyema, hematoma, sarcoma, carcinoma, enchondroma, and osteoma of the sinus.

WALTER HAENEL.

159. In **Roberts's** operation for deflected septum, which consists in loosening the septum from its attachment at the floor of

the nose by an incision, with or without oval excision of redundant cartilage, and subsequent fixation by means of a pin, which is inserted like one to a buttonhole bouquet, GIBB devised a special round pin constructed from one piece of metal, with a bulbous end, the length of the pin varying from three-quarters to two and a half inches. TOEPLITZ.

160. Palpation exercised with a thoroughly aseptic finger is valuable in establishing the diagnosis in adenoids, malignant disease, follicular tonsillitis, suppurative tonsillitis, peritonsillar abscess, and foreign bodies. It acts as a guide in intubation, dislodges rhinoliths, and helps to replace the fractured septum in Asch's operation. TOEPLITZ.

161. In some few cases the upper turbinated body can be seen by anterior rhinoscopy, as BERGEAT shows on preparations and by observations in the living. KILLIAN.

EXTERNAL EAR.

162. EITELBERG, A., Vienna. Otiatric communications. *Wien. med. Presse*, No. 17, 1896.

163. RICHARDSON, C. W., Washington. A case of living maggots in the normal meatus. *These ARCHIVES*, Germ. Ed., xxviii., p. 292.

164. MIOT. On artificial permanent perforations. *Rev. hebdom. de laryng.*, etc., No. 26, 1896.

162. EITELBERG saw in two cases perforation of abscesses of the lower lobe of the parotis through the inferior wall of the auditory canal, and quite frequently circumscribed otitis externa produced by accumulations of cerumen. POLLAK.

164. MIOT dissects the posterior and then the anterior periphery of *Mt*, leaving a bridge at the lower border. After this is also cut, the manubrium with the *Mt* is removed. He obtained a permanent perforation in twenty out of twenty-four such operations. M. advocates this procedure in dry aural catarrh, when the paracentesis improves the hearing power. The results were very inconstant. ZIMMERMANN.

MIDDLE EAR.

165. EITELBERG, A., Vienna. Contributions to facial paralysis in non-purulent ear affections with Ménière's symptoms. *Wien. med. Woch.*, No. 27, 1896.

166. ZWAARDEMAKER, H., Utrecht. An initial symptom of sclerosis. *Zeitsch. f. Ohr.*, vol. xxviii., p. 119.

167. LANNOIS. Normal middle ear and microbes. *Ann. des mal. de l'oreille*, etc., No. 5, 1896.

168. LANNOIS. Acute middle-ear catarrh and microbes. *Ann. des mal. de l'oreille*, etc., No. 6, 1896.

169. BERNSTEIN, E. J. Treatment of chronic otitis media. *Maryland Med. Journal*, June 13, 1896.

170. SPEAR, EDMUND D. The relation of the thyroid gland to certain diseases of the ear, with a theory of its function. *Boston City Hospital Med. and Surg. Reports*, 1896.

171. PODACK, Max, Koenigsberg. On the relation of croup after measles and the affections of the middle ear following diphtheria to the diphtheria bacillus of Klebs-Loeffler. From the medical university clinic of Prof. Lichtheim. *Deutsches Archiv f. klin. Medicin*, vol. lvi., p. 34.

172. MOURE. Observation of an angiomatous polypus. *Rev. de laryng.*, *d'otol.*, etc., Dec., 1895.

173. BISHOP, S. S. Gangrene of the ear. *Four. Amer. Med. Assoc.*, March 28, 1896.

174. MARSH, F. A case of cholesteatoma of mastoid. *Brit. Med. Journ.*, April 25, 1896.

175. FARACI. Surgery of the middle ear, and critical examination of the consequences of operations on the attic in regard to the hearing power. *Palotta Edit.*, Rome, 1895.

176. BRONNER, ADOLPH. The symptoms and treatment of diseases of the attic. *Lancet*, June 6, 1896.

177. JONES, H. E. Present position of radical operations for chronic suppurative otitis. *Brit. Med. Journ.*, May 30, 1896.

178. LICHTENBERG, KORNEL, Budapest. On suppurations of the attic in a case of otorrhœa of thirty-three years' standing; cured by operation. *Wien. med. Wochenschr.*, No. 25, 1896.

179. HAMON DU FOUGERAY. Study on the different methods of treatment of chronic purulent otitis media. *Ann. des mal. de l'or.*, etc., No. 6, 1896.

180. BRUNNER, CONRAD, Muensterlingen. On the pathogenic action of the bacillus of Friedlaender. A case of acute metastatic general infection after otitis media and empyema of the mastoid process.

181. MOURE. On some anomalies of the mastoid region. *Rev. hébdom. de laryng.*, No. 24.
182. TOTI. On radical surgery in chronic suppuration of the middle ear in relation to pathology. *Il Policlinico*, ii., No. 17.
183. LUBET-BARBON. Empyema of the mastoid with suppuration of the tympanic cavity. *Arch. intern. de laryng. d'otol.*, No. 3, 1896.
184. VEIHER. Three cases of otitis media with mastoid complications cured without surgical intervention. *Ann. des mal. d'or.*, June, 1896.
185. SHEPPARD, J. E. Two cases of acute mastoiditis in persons suffering from diabetes mellitus. *Med. News*, May 2, 1896.
186. KOERNER, Rostock. A new contribution to aural and mastoid suppurations in diabetes, with remarks on the percussion of the mastoid process. These ARCHIVES, German Edition, vol. xxviii., p. 285.
187. SZENES, SIGISM., Budapest. Is a conservative or radical treatment indicated in acute cases of mastoid diseases? *Wien. allg. med. Zeitung*, No. 25, vol. xxvi., 1896.
188. GRADENIGO. Contribution to the pathology and surgery of the mastoid process. *Archivio ital. di Otol.*, p. 341, 1896.
189. CHEATLE, ARTHUR H. A case of middle-ear suppuration; mastoiditis; death from rupture of the œsophagus. *Pediatrics*, April 15, 1896.
190. COZZOLINO. A new method of radical opening of the mastoid process. *Bollettino delle mal. dell'orecchio*, etc., March, 1896.
191. REDMER, C., Danzig. On spontaneous healing of cholesteatoma, or affections similar to cholesteatoma, of the cavities of the petrous bone. From the ear clinic of Rostock. These ARCHIVES, vol. xxv.
192. GRUNERT. Contribution to the operative exposure of the cavities of the middle ear. *Archiv f. Ohrenheilk.*, vol. xl., p. 188.
193. LANNOIS and JABOULAY. Hemianopia in otitic brain abscess. *Rev. hébd. de laryng.*, etc., No. 23, 1896.
194. OPPENHEIMER, H., Berlin. On the character of aphasia in otitic abscess of the left temporal lobe. *Fortschritte der Medizin*, xiii., p. 378.

195. POULSEN, KR., Copenhagen. On cerebral affections in otitis media. *Arch. f. klin. Chirurgie*, vol. lii., p. 415.

196. KRETSCHMANN, Magdeburg. A case of serous meningitis cured by operation. *Muench. med. Wochenschr.*, No. 16, 1896.

197. LICHTENBERG, KORNEL., Budapest. Cases of otitic intracranial complications. *Wiener med. Presse*, No. 19, 1896.

198. SCHMIEGELOW, E., Copenhagen. Intracranial complication in the course of purulent otitis media ; trephining ; recovery. *Zeitsch. f. Ohr.*, vol. xxviii., p. 135.

199. OLIVER, J. C. Cerebral surgery. *Four. Amer. Med. Assoc.*, May 30, 1896.

200. HUBBELL, A. A. Report of a case of otitic brain abscess, with remarks on diagnosis. *Buffalo Med. Fourn.*, May, 1896.

201. SWAIN, HENRY L. Cerebral disease following otitis media purulenta chronica, with a case. *Yale Med. Fourn.*, Jan., 1896.

202. URQUHART, R. A. Two cases of abscess in the mastoid region associated with diabetes mellitus. *Med. News.*, March 21, 1896.

203. DAHLGREN, CARL, Upsala. Three cases of thrombosis of the sinus transversus after otitis media ; operation ; recovery. *Arch. f. klin. Chirurgie*, vol. lii., p. 608.

204. VENTRINI. On infectious thrombosis of the intracranial venous sinus. *Il Policlinico*, ii., 11, Nov., 1895.

205. HAUG, R. On exudations in the attic in influenza, with report of a case of thrombosis of the sinus, cured by operation, and two interesting post-mortem examinations. *Arch. f. Ohrenheilk.*, vol. xl., p. 161.

165. The patient, æt. thirty-five, fell from a horse, and struck his head on the hard soil. Immediately vertigo, vomiting, tinnitus and hardness of hearing in left ear. Four days later the examination revealed : Traumatic perforation of Shrapnell's membrane with ecchymosed borders, on the seventh day paralysis of the facial nerve. Complete recovery after two months' treatment. In another case, tinnitus and vertigo without impairment of hearing followed an energetic mopping of the pharynx with a 10 % solution of nitrate of silver ; after ten months, paralysis of the right facial nerve, still persisting for one year and a quarter. Eitelberg does not understand the pathogenesis in either case.

POLLAK.

167. Pieces of the mucous membrane of the tympanic cavity of several rabbits and of four dogs or the ossicles were removed in a sterile condition and used for culture experiments. The bouillon remained sterile as long as a secondary infection could be excluded. LANNOIS attributes this asepsis of the tympanic cavity to the faculty of the nasal mucous membrane to retain and destroy germs which may have entered, and to the possibility that the mucous membranes of the tympanic cavity and the nose have bactericidal properties. ZIMMERMANN.

168. LANNOIS found the exudation evacuated by paracentesis, in 6 cases of middle-ear catarrh, sterile in 7 out of 12 cultures. This agrees with the theory (in Lannois's opinion) derived from experiments on animals, and Lannois thinks that there will be less micro-organisms in an exudation of longer duration, upon which the bactericidal properties of the mucous membrane have more time to act than in one of more recent origin. ZIMMERMANN.

169. BERNSTEIN says in his paper that, after looking into the direct and indirect causes in each case, the catarrhal inflammation of the Eustachian tube must also be treated locally. The Eustachian catheter, bougie, and Eustachian syringe, with the Politzer bag, are necessary. Injections into the middle ear are of service in some cases, as well as massage of the ankylosed ossicles, either by a cotton-tipped probe resting on the short process and worked by hand, or by some of the electric vibrators. He finds the vibrometer worthless. In regard to excision of the ossicles, the author says: "I have tried it in a number of cases, and shall not do so any more, my patients having lost what little hearing they had, though for a time there was marked improvement. GORHAM BACON.

170. SPEAR gives a résumé of the principal statements in the article as follows. "Cases of progressive disease of the ears occurring in patients whose nervous organization is abnormal, and who usually complain of hissing, roaring, or ringing noises, whose ears upon examination with mirror and speculum present slight alterations, are found to have lost the power of hearing the lower tones of the musical scale. Among these cases a large percentage have a noticeable enlargement of the thyroid gland, and all have swelling or hypertrophy of the turbinate bones. The displacement of the malleus and locking of the malleo-incudal joint, brought about by the closure of the Eustachian tube in

consequence of the lack of inhibitory action upon the turbinate body by the thyroid gland, is, in the early stages of these affections, the cause of the impairment of hearing. In the later stages of the disease a fixation of the other ossicles takes place, until the stapes finally becomes firmly set in the niche of the foramen ovale, thus producing almost complete loss of sound conduction."

GORHAM BACON.

171. Two of three fatal cases of croup after measles, which showed Klebs-Loeffler's diphtheria bacilli in the croup-membrane of the throat, were complicated with purulent otitis media. The latter contained Loeffler's bacilli in the purulent aural discharge (as proven by culture and inoculation). One of them was a case of diphtheria of the middle ear, as confirmed by the fibrous pseudomembrane in the tympanic cavity, with diphtheria bacilli, which had spread from the pharynx to the mucous membrane of the tympanic cavity, predisposed by chronic inflammation. In the other case it was impossible to decide whether it was diphtheria of the middle ear or whether the diphtheria bacilli found in the purulent aural discharge had only a saprophytic character, since there was no fibrous exudation in the middle ear. Probably there existed at first an ordinary purulent otitis media (two weeks before the outbreak of measles), or a primary diphtheria of the middle ear. The diphtheria bacilli may cause infection from the middle ear long after subsidence of the affection of the pharynx. In that respect the middle ear is just as dangerous a hiding-place for bacilli as the nasal cavity. The author considers the croup in measles as well as the primary croup of the larynx as diphtheritic.

HAENEL.

172. MOURE observed a reddish tumor of the size of a grain at the entrance of the auditory canal of a woman, aged forty-seven. It was situated on top of another tumor, which seemed to spring from the posterior upper wall of the tympanum, and was surrounded by pus. Removal with snare produced a copious hemorrhage of dark blood. Tamponade with iodoform gauze for four days. The histological examination showed that it was an angiomatous polypus, some portions of which consisted of connective-tissue.

DUBAR.

173. George T., two years old, was admitted to the hospital, January 8, 1896. Two months previously he had suppuration of the right ear, which continued up to the present time. Five days ago the concha turned black and emitted a foul stench. The

necrotic process involved both the anterior and posterior surfaces of the concha. The sloughs were removed with scissors and a mastoid operation performed, as the bone was involved. The patient rallied well. Iodoform dressing was used. The progress toward recovery was excellent until the child had measles on January 25th, followed by pneumonia. It died January 31st. The post-mortem examination showed miliary tuberculosis of both lungs and pneumonia of the right lung, hyperæmia of the cerebral meninges, and hydrocephalus. GORHAM BACON.

174. At a meeting of the Midland Medical Society, held March 18, 1896, MARSH related the case of a man aged twenty, who had suffered with discharge from the right ear since measles in childhood, and occasional abscesses in the mastoid region; at the operation a cavity two inches in diameter was found in the mastoid filled with foetid putty-like débris; the upper limit of the cavity was one inch above the superior meatal wall; bone surrounded the cavity except posteriorly where the cerebellum could be felt. CHEATLE.

175. FARACI discusses systematically and in detail the prognosis of surgical measures in regard to the hearing power, which it is impossible to enter upon here. He gives a great number of experimental facts, and his conclusions in regard to the mobilization of the stapes and its ectomy are very important.

GRADENIGO.

176. In the treatment of attic disease BRONNER advises enlargement of the perforation, removal of granulations and caseous matter by curette and syringe, the malleus and incus removed if loose. If these fail to produce a cure, and if the external meatus is too narrow to allow of treatment, he opens up and explores the attic, making a long incision behind and round the top of the ear down to the tragus, cutting through the meatus, pulling the whole ear downwards, and removing the outer attic and posterior meatal walls with the chisel. He relates the case of a man who had had middle-ear discharge for twenty years, during which time Wilde's incision had been necessary on three occasions. On operating, the mastoid was found healthy, but a large cholesteatoma occupied the attic. Of 42 cases of perforation in Shrapnell's membrane, 30 were cured by curetting and syringing; 2 required removal of ossicles under chloroform; and 10 had the radical operation performed. Bronner points out that some mastoid cells are found on a level with the attic, which require opening and scraping. CHEATLE.

177. In discussing this subject, JONES classifies cases of otorrhœa into five groups and appends the treatment he adopts for each group.

A. (i) Simple chronic purulent inflammation limited to the cavity of the tympanum, with perforation in the *membrana tensa*.

(ii) The disease limited as in (i) but accompanied by formation of polypi unconnected with bone disease.

(iii) In which removal polypi or granulations from easily accessible parts of the tympanum or meatus reveals small superficial patches of roughened bone.

Treatment : unless tubercular, this group amenable to simple methods, including curetting, if properly carried out.

H. (iv) Attic suppuration with or without caries of the ossicles.

(v) Cases originally belonging to one of the above four classes, in which adhesions between the ossicles, and ossicles and tympanic wall, interfere with drainage or cause extreme deafness, tinnitus, or giddiness.

Treatment : in the majority of cases in this group, remove ossicles.

C. (vi) Chronic suppuration in mastoid antrum.

(vii) Cholesteatoma.

(viii) Caries of antrum or some part of tympanic wall, which, though inaccessible per meatum, can be removed by operation without risk to important structures.

Treatment : Stacke-Schwartz operation.

D. (ix) Caries or necrosis of petrous bone which cannot be eradicated without destroying important structures or without risk of life.

Treatment : as exfoliation must take its own time it is best to establish a permanent opening in mastoid.

E. (x) Caries and hyperostosis or exostosis proceeding side by side.

Treatment : operation by means of a dental burr. Jones raises the question as to whether the whole tympanic mucosa should be removed, and thinks that, except in cases of tubercle, cholesteatoma, and extensive caries, it is better to preserve as much of the natural lining as possible, as perfect dryness is not a criterion of health in the middle ear any more than in the nose or mouth.

CHEATLE.

179. Nothing new, but a careful synopsis of the changes of otorrhœa. DU HAMON FOUGERAY recommends, after many trials, tamponade with gauze impregnated with naphthol-chinolin

(Haug), with some reservation, however. He observed a cure in 66 per cent. Finally he gives a model according to which he intends to record his statistics. ZIMMERMANN.

180. A man, aged fifty-five, had purulent otitis of left ear for 4 weeks. Symptoms of mastoid disease set in; opening of mastoid; much pus was evacuated. Euphoria for 5 days was followed by severe meningitis. Death on the 17th day. The post-mortem examination revealed purulent meningitis at the base and convexity, thrombosis of sinus transversus, and longitudinalis; no abscess. Numerous abscesses in both kidneys. Advanced cirrhosis of the liver. Spleen enlarged and soft. Bacteriological examinations were made of pus, evacuated by trephining, pus from the dura taken at the post-mortem, blood of the longitudinal sinus, heart, liver, spleen, kidneys, and urine. In each case a bacillus was cultivated which was identical with the bacillus of Friedlaender morphologically and in cultures. BRUNNER surmises that this bacillus enters the middle ear from the naso-pharynx, where it is found even under normal conditions—rarely however,—and causes purulent otitis with general infection. The latter was favored by the cirrhosis of the liver, by which the “anti-bacterial coefficient” of the organism was weakened. MUELLER.

181. MOURE does not acknowledge Zuckerkandl's statement in regard to the structure of the mastoid process—taken from abstracts—in cases of chronic suppuration. He found 4 pneumatic, 25 sclerosed and 4 unusually small mastoid processes out of 34 operative cases, of which 16 were chronic. Of the acute cases he found a normal antrum in 14, in 3 the antrum enlarged by fungoid masses, and one displaced forward. The antrum was reduced to a minimum in 10 chronic cases, in 5 considerably enlarged and without other pneumatic cells. These conditions were mostly owing to a destructive or sclerosing otitis. Moure relates two interesting cases. In the one the sinus was directly injured in opening a sclerosed mastoid process, so that the operation had to be interrupted. The patient died with a typical erysipelas, which had developed the next day. The post-mortem revealed that the antrum filled with cheesy matter corresponded to the centre of the osseous meatus, and the sinus, otherwise healthy, was situated immediately under the place of trephining. In the other case a cavity 5 mm deep was reached, which seemed to be filled with granulations. In scooping it with a sharp spoon it was

found to be the sinus. After removal of the posterior wall of the meatus the tympanic cavity and a very small antrum were reached. This was hidden by the projecting sinus and its tegmen was formed by the dura mater, where the bone showed dehiscence.

ZIMMERMANN.

182. TORI's method differs from others in that he scrapes the walls of the opened middle-ear only in cases of cholesteatoma. Tamponade with iodoform-gauze. The lowest tampon remains until it loosens itself; boric acid is powdered between the old and new tampons.

GRADENIGO.

183. Cases of purulent mastoiditis without affection of the tympanic cavity are rare. LUBET-BARBON observed 6 in which the manner of development and localization were the common symptoms. They develop very slowly, sometimes 3 months from the original inflammation of the pharynx up to the acme. They cause intermittent ailments and the inflammation of the tympanic cavity, which has to be considered as medium, shows only slight symptoms. The course may be very treacherous by sudden general infection and cerebral complication, so that opening must not be delayed. The location is especially characteristic. Mostly the cells at the apex of the mastoid process have to be looked after in the operation, whereas ordinarily the antrum is first affected.

ZIMMERMANN.

184. None of the 3 cases was completely cured. The first case, of 1½ years' standing with still slight muco-purulent discharge from the tympanic "cavity," is mentioned as successful; also the other with suppuration scarcely noticeable. In the third acute case, tenderness of the mastoid process on pressure still existed when the patient left treatment, which had lasted a quarter of a year. The first and third cases were very serious, and the abstaining from an operation must appear rather dangerous to those who have seen a rupture of the abscess inwards under similar conditions. VEIHER had very favorable results with hydrogen chloride.

ZIMMERMANN.

185. SHEPPARD reports 2 cases of mastoid disease, 1 due to snuffing salt water up the nose, and the other due to influenza. Of 175 cases of affections of the mastoid, of which the writer has notes, only 2, to his knowledge, had diabetes. Sheppard believes that such cases should be operated on, and the earlier the better. In the 2 cases reported, both were operated on, with the

result that 1 recovered and 1 died. The cause of death was erysipelas and probably purulent meningitis. GORHAM BACON.

187. SZENES advocates the golden mean treatment.

POLLAK.

188. GRADENIGO operated on 48 acute and 88 chronic affections of the mastoid process, together 136, within 17 months. The male sex and the left ear were predominant. The acute affections are more frequent in the second, the chronic in the third decennium. Bezold's variety of mastoid suppuration in 30 %. A case of septic thrombosis of the sinus, and 4 cases of extradural perisinuous abscesses recovered, 1 died of meningitis. The mode of operating in the chronic cases was: complete suture of the wound at the mastoid and drainage of the meatus. Cholesteatoma existed in 30 cases. The necrotic cochlea was removed in 2 cases, sequestra of the mastoid process in 3, 2 cases of fatal meningitis, and 2 of cerebral abscess. One cerebral and 4 extradural abscesses recovered.

GRADENIGO.

189. A child aged four years was admitted, under Dr. Urban Pritchard, into King's College Hospital with a history of discharge from the right ear for six days, with shivering. On admission the boy was anxious-looking, complaining of pain in the ear, which was discharging a large amount of muco-purulent, non-offensive pus. A small pin's-head perforation in the membrane; tenderness behind the ear, but no redness or swelling; temperature 103°, under chloroform the membrane freely incised; no improvement on the following day; a soft spot found immediately behind the auricle; two days later fluctuation detected behind the ear; in Professor Urban Pritchard's absence A. CHEATLE cut down and found the mastoid process dry, discolored, and surrounded by pus; nothing definite in the antrum; an ulcer found on wall of lateral sinus opposite diseased mastoid; no thrombosis; death occurred suddenly some 33 hours after operation. Post-mortem examination showed site of operation healthy; on opening chest numerous small sub-pleural hemorrhages present, and a large recent hemorrhage in the posterior mediastinum; stripping of parietal pleura largely on the left side and slightly on the right; an irregular opening found in œsophagus opposite the tracheal bifurcation; the lower third of the tube soft and tearing easily; blood in stomach but not in small intestine; no foreign body. Cheatle thinks the case to have been one of acute infective œsophagitis secondary to the septic otitis. CHEATLE.

190. COZZOLINO reflects the soft parts to the root of the arcus zygomaticus in opening the mastoid, and uses the arcus as guide in entering the deeper parts. GRADENIGO.

192. GRUNERT divides, from an anatomico-pathological standpoint, 209 observations from the ear clinic at Halle into those of caries and cholesteatoma, although they may occur simultaneously. In 113 cases of uncomplicated caries the tympanic cavity almost always was affected,—a reason why, in all cases, the operator must reach the tympanic cavity, as it is generally done. In 19 % of these cases only the ossicles were carious, in 13 % the tegmen tympani, the promontorium mostly superficially. In caries of the floor of the tympanic cavity sometimes the adjoining floor of the meatus was diseased. If the hammer is diseased, *the anvil also is always carious*. Only in 25 % the hammer was healthy. In 2 cases osseous ankylosis between them, and formation of osteophytes on each. The mastoid cavities, especially the lateral wall of the aditus, participated in about $\frac{1}{8}$ of all cases of caries. Even a large portion of the posterior wall of the meatus may also be affected. Tubercles, giant cells, and tubercle bacilli were rarely found.

Osteosclerosis occurred only in 10 % of this large number of cases of caries, in 5 % of which in the cortical substance of the mastoid process, and in 2 cases the antrum was entirely obliterated by this process. Grunert also opposes the theory of preventive reaction of osteosclerosis, since it occurs almost always at the surface, starting from the peritoneum, and does not encircle the focus of pus. In rare cases the lumen of the meatus grows smaller through sclerosis.

Out of 96 cases of cholesteatoma, thus far not published, the process was limited to the attic and tympanic cavity only in 5 ; in all others the mastoid cells were diseased. The cholesteatoma formed tumors in one third of the cases, and spread more in flat surfaces in two thirds, so that the cavities were lined with epidermis, but stratiform accumulations were wanting. Grunert thinks that this form may be the last stage of the disease. In some cases a cholesteatomatous cavity, communicating with the tympanic cavity at times, was situated under the floor of the meatus. A break of the masses into the maxillary joint has been observed.

The ossicles were generally also diseased, and thus the immigration of epidermis may occur through the perforation of Shrap-

nell's membrane—according to the well known supposition. Unlike caries, the most medial portion of the posterior wall of the meatus is not defective in cholesteatoma, but the lateral portion or the whole wall. In 6 cases the internal ear, the promontory, or the horizontal semicircular canal as perforated by the cholesteatoma. If this perforation is due to caries, the epithelium perhaps grows towards the antrum (from the semicircular canal), and thus produces cholesteatoma.

Osteosclerosis occurred more frequently than in caries, viz., in 13½ %.

In either case, besides the atticus operation, the *antrum* is *typically opened* in Schwartz's clinic, and the posterior wall of the meatus, osseous portion, etc., removed. This is deviated from only in exceptional cases. The new-formed cavity must be laid open freely for inspection. In 9 out of 300 cases paralysis of the facial nerve occurred, which, as a rule, disappears within weeks or days. If granulations or sequestra have to be removed from the labyrinth, no special harm is done the ear, the hearing power of which is already destroyed. The same is the case in removal of the diseased stapes.

In large cholesteatomata always a persistent retroauricular opening is made.

The after treatment aims at epidermization and keeping open the whole bone cavity established by the operation. The best means to check the exuberant growth of granulations is careful tamponade. Later on the access of air acts beneficially on the definite formation of new skin. The obliteration of the tympanic orifice of the Eustachian tube must sometimes be artificially obtained by means of the galvano-cautery.

In concordance with Stacke, Schmiegelow, and others, 75 % recovered in Schwartz's clinic. But even in those cases in which recovery is not obtained, the patient gains through the free drainage and the possibility of a later secondary cure.

If the labyrinth has been intact, the hearing power may increase after removing the obstacles in the sound-conducting apparatus.

BLOCH.

193. In a man, aged twenty-five, with chronic purulent otitis of left ear, typical symptoms of cerebral abscess, viz., word blindness and right hemianopia (Wernicke's reflex symptom was preserved), developed with vertigo, right hemiparesis, vomiting, and headache. Operation: The severely diseased mastoid process

and tympanic cavity were scraped out, a portion of the squama and the tegmen removed. Then a small extradural abscess was detected. The dura mater was incised and a Potain's needle of largest size thrust into the temporal and occipital lobe and in the direction of the frontal lobe; no pus. Puncture repeated, but also unsuccessfully, after eleven days, since there was no improvement and fever had set in. A third puncture, after eight days, liberated pus from a focus in left occipital lobe. Death after eleven days. The post-mortem revealed an abscess of left occipital lobe of the size of an orange, which had opened into the lateral ventricle. The frontal convolutions were softened. The chief point of interest rests in the hemianopia, besides the word-blindness, in the opinion of the authors. They consider this as a much more frequent symptom, which, however, might easily be overlooked, because the patients do not mention it of their own accord. The needle may be supplanted by a trocar, since the former may easily become obstructed by brain matter, as happened in the two first punctures. Von Bergmann's method with the knife is not mentioned.

ZIMMERMANN.

194. In a portion of cases, sensory aphasia, or word-deafness, occurred, generally associated with paraphasia or amnesic aphasia, sometimes amnesic aphasia without word-deafness. The disturbance of speech is due to a lesion of the sensory centre of speech, or an interruption of the fibres connecting it with other cortical centres, or to both. In the rare cases in which the patient does not speak at all, making the impression of an aphasic, the inflammatory oedema and the softening extend perhaps as far as to the motor region of speech. If the fibres of association between the acoustic and the optic centres are severed, optic aphasia results, i.e., the incapability to name the objects seen; often, also, a certain difficulty in defining objects perceived by other senses, since the optic memory plays an important part in the formation of words. Optic aphasia is connected with partial word-deafness of all words and definitions, the understanding of which requires intact association of the centres of speech and vision, i.e., acoustic-optic aphasia.

HAENEL.

195. POULSEN collected the clinical histories and autopsies of all cases of cerebral affections after otitis media, treated in the Commune-Hospital of Copenhagen in the years 1870-1895; a case of cerebral abscess and one of thrombosis of the sinus, healed by operation in his private clinic. In connection with this material he

discusses in detail the symptomatology and therapeutics of such cerebral affections. Twelve of the cerebral abscesses were in the temporal lobe, 5 in the cerebellum; 4 of the latter were complicated with sinus thrombosis. In no case was the diagnosis of cerebellar abscess made. The 6 cases of cerebral abscess of the temporal lobe occurring *before* 1887 all died without operation, in 5 of the remaining 6 the cerebral abscess was opened by operation, 3 of which recovered. Poulsen often observed a relatively rapid development of cerebral abscess: 17 cases of thrombosis of the sinus, of which 10 were *before* 1891; 9 of these succumbed without the disease being recognized; 1 case with pretty certain diagnosis recovered through resection of the mastoid process without opening the sinus. The opening of the sinus after trephining was performed in 5 of the cases treated since 1891, each without tying the jugular vein, only *one* recovery. Poulsen is aware that the ligature of the jugular vein obstructs the chief passage for thrombotic particles, but gives no absolute guaranty and is not without danger. Therefore he does not recommend the ligature and advises to limit the emptying of the sinus and the removal of the purulent parts of the thrombus, since the hemorrhages of the sinus following its thorough cleansing often necessitate a long-lasting tight tamponade, which might lead to retention of pus. All 19 cases of meningitis died. If cerebral symptoms set in in the course of a chronic otitis media, which do not admit of an exact diagnosis of a certain cerebral affection, and persist even after a thorough scraping of the tympanic cavity and resection of the mastoid process, Poulsen advocates explorative trephining of the skull. If no extradural abscess is found nor thrombosis of the sinus, the puncture or incision of the brain is perfectly legitimate.

HAENEL.

196. In a case of cholesteatoma in a boy, aged thirteen, vomiting, occipital headache, stiffness of the neck, retardation of the pulse and bilateral papillitis occurred. At the operation, besides a large decaying cholesteatoma, a non-infectious thrombus, adhering to the wall of the sinus transversus, was met with, but neither a subdural nor a cerebellar abscess was found, nor one in the temporal lobe. Both were punctured. However, a large quantity of fluid gushed out after opening the dura mater, followed by a prolapse of cerebral substance. All symptoms disappeared after the operation. From this and the enormous secretion of cerebro-spinal fluid KRETSCHMANN inferred that it might be a case of serous

meningitis, as described by *Quinke*. The further course confirmed his assumption, since a relapse of cerebral symptoms disappeared by itself within three weeks, after the secretion of cerebro-spinal fluid increased, which had been diminished with the onset of the former. Therefore the symptoms must have been due to a retention of fluid. The author attributes the cause of the serous meningitis to the long-standing suppuration in the petrous bone, analogous to the appearance of serous pleurisy in curves of the ribs and similar processes. For the treatment of serous meningitis a wide opening of the cranial cavity may be indicated, the more so as an exact diagnosis generally cannot be made, especially since the formation of an abscess cannot safely be excluded.

MUELLER.

197. LICHTENBERG reports a case of otitic perisinuous and peridural abscess of the middle cranial fossa, operated on, but without anything specially remarkable.

POLLAK.

199. OLIVER reports a case of a man aged twenty-six, a printer, well nourished. The patient had had four months previously an intense acute otitis media with drumhead bulging. Paracentesis was performed and fluid evacuated. The drumhead was punctured a second time, and after that there was a profuse discharge and the man was able to attend to his duties. When next seen the patient was at his residence, comatose, with pulse 90, pupils contracted to size of a pin's head; Cheyne-Stokes respiration. He was removed to the hospital. He became restless, had a high temperature and was in a semi-comatose condition. An exploratory opening was made in the skull and the temporo-sphenoidal lobe examined, but no pus was found. A trephine opening was then made in the bone on a level slightly below the external occipital protuberance and slightly nearer the mastoid portion of the temporal bone than the protuberance. The cerebellar lobe was explored but nothing was found. The patient died 45 minutes after removal to the ward. At the autopsy there was found a diffuse purulent meningitis involving both the convexity and base. There was considerable caries of the temporal bone.

GORHAM BACON.

200. W. B., aged twenty, a waiter, entered the hospital July 22, 1895, with a history of headache, loss of appetite, and nausea. The left ear had discharged since he was six years of age. During the past three days he has had severe pain in the left ear and left side of the head. Examination showed the presence of a large

polypus with an offensive discharge. The polypus was partly removed and the ear syringed with antiseptic solutions. The auditory canal became more swollen and the head symptoms more pronounced; pulse, 60 and full; respirations, 10; temperature, 97° F.; pupils reacted slowly to light. He finally had delirium, chills, vomiting, dizziness, prostration, and convulsions. No operation was undertaken. At the autopsy there were found two or three distinct openings in the roof of the tympanum and leading to an abscess in the temporo-sphenoidal lobe, the size of a walnut.

GORHAM BACON.

201. After considering the importance and necessity of treating carefully all cases of suppurative disease of the ear, as well as the dangers of neglect of treatment, the writer reports the following case: A young man, aged twenty-two, a farmer, healthy in appearance and of good habits, had a discharge four months ago from his left ear, and this had continued ever since. When seen at this time he had considerable pain in the ear and head, which was worse at night. His appetite was poor, and he was feeling very badly. The discharge from the ear was most offensive; hearing markedly less than it had been. On examination there were symptoms of mastoid disease, with swelling of the external auditory canal. The drumhead was wanting, except for a small part superiorly. In the attic was bad-smelling pus. Watch not heard, and tuning-fork doubtful. Temperature, 99° F., and the pulse was not very strong. The canal was cleaned out and some scraping done in the attic. In two weeks' time the same condition of affairs had returned—*i. e.*, canal narrowed, granulations numerous, and discharge very offensive. He disappeared from observation for some little time, and when next seen he was admitted to the hospital in a critical condition; he had his eyes half closed, mouth open, and breathing stertorously. The ear was raised from the head, and the canal showed the same appearance as before. He complained of headache. The neck was stiff, and the respirations rapid, as frequent as 42, and the pulse weak, thready, and rapid. Temperature, 100.2° F. It was suspected to be a case of basilar meningitis. The ice-coil was applied to shaven vertex and left side of head, the ear was douched, and iodide of potash given in good-sized doses. At first there was a slight improvement, but later the patient became worse. The attic was again scraped, and later a button of bone removed from the skull, the centre of the opening being $1\frac{1}{4}$ inches behind and $1\frac{1}{4}$ inches

above the centre of the auditory meatus. A healthy dura protruded through the opening. A trocar was plunged into the brain substance in different directions, but no abscess was discovered. He died twelve hours later.

Autopsy.—Lungs showed many miliary tubercles. On removing brain, a typical basilar meningitis was found, extending down on the medulla. In examining the left temporal bone, the entire cochlea was found disorganized and filled, as were the semi-circular canals, with the same pultaceous mass as was the middle ear. Some tubercle bacilli were found in the contents removed from the middle ear.

GORHAM BACON.

202. Of the two cases reported, one was that of a woman, aged fifty-seven, who had suffered from diabetes for the past six or seven years. She had pain in the right ear, with some redness of the drumhead, and redness and swelling of the auditory canal. The symptoms increased in severity for a time, but subsided under hot-water applications and syringing of the ear.

The second case was that of a patient sixty-five years of age, in whom the mastoid region alone was involved, with only slight congestion of the drumhead. The pain, slight at first, became much more severe. The hearing was good at all times. A deep incision, made over the affected area, showed a diseased periosteum.

GORHAM BACON.

203. The cases had been operated upon in the surgical department of the Academic Hospital at Upsala, in the year 1894. Thrombosis of the sinus originated in acute otitis media in 2 cases, one of which was apparently very slight, without perforation; in a third case it was due to cholesteatoma of the middle ear. The double ligature and cutting of the jugular vein preceded in each case the incision or emptying of the sinus after opening the mastoid process. DAHLGREN advises this method in all cases. The operation was successful in all the three cases, also in regard to the ear affection.

HAENEL.

204. VENTRINI's paper is based on 3 cases from Gradenigo's clinic. The operation was successful in 2 cases, the third was fatal, because the operation came too late. The symptoms and treatment are set forth in detail.

GRADENIGO.

205. In 64 out of 214 cases of influenza-otitis, the epitympanic portion (attic) was diseased. Ten clinical histories and 2 post-mortem examinations are reported as typical forms. Influenza-bacilli were found in a few cases. HAUG mentions the

hemorrhagic nature of the inflammation as characteristic, in concordance with others. The exudation does not relapse after early paracentesis, for it is absorbed even without the latter. Conic bulging of the *Mt*, with perforation at the apex, required surgical treatment, as it did not disappear by itself. If the exudation was in front of the short process, vertigo and mastoid complications did not occur, as they usually did in affections of the posterior portion of the attic. In the latter the mastoid process may be primarily affected, and their course is the same as in other similar cases. Caries may be found after the third or fourth week, if not operated on before. The healing of the cases operated on may take from five to seventeen weeks, as in uncomplicated cases. In the case of thrombosis of the sinus, the decaying matter was removed. Recovery took place without ligating the jugular vein.

BLOCH.

NERVOUS APPARATUS.

206. BONNIER. The lesions of the labyrinth and the reflexes. *Communic. à la Société de Biologie*, Paris, 1896; *Médecine moderne*.

207. GELLÉ. Treatment of labyrinthine vertigo. *Ann. des mal. de l'or.*, etc., No. 6, 1896.

206. BONNIER attempted to investigate, whether affections of the labyrinth, with marked disturbances of equilibrium and visual and bulbar symptoms, influence the patellar reflex. He observed that the reflexes are little changed, if the labyrinthine symptoms develop slowly, and in acute diseases of the labyrinth through exudations in the labyrinth. The patellar reflexes are increased, however, in acute "insufficiency" of the labyrinth, diminished in labyrinthine irritation.

DUBAR.

207. GELLÉ's observations are based on the remarkable number of over 500 cases of aural vertigo. He discriminates 8 species of vertigo: (1) Dependent upon pressure from the middle ear; (2) due to hemorrhages; (3) to congestion; (4) anæmia; (5) hyperæsthesia; (6) inflammation in the labyrinth; (7) toxæmia; and (8) reflexes. These different forms may be combined. Sulphate of quinine is the chief remedy.

ZIMMERMANN.

NOSE AND NASO-PHARYNX.

208. FERMI E BRETSCHNEIDER. Studies on the nature and etiology of catarrhal rhinitis simplex. *Arch. ital. di Otol.*, anno iii., p. 438; anno iv., p. 23.

209. WOODRUFF, E. G., Auburn, N. Y. Acute and chronic rhinitis in childhood, and its importance. *Wien. med. Blätter*, No. 27, 1896.

210. GERBER and PODACK, Koenigsberg. On the relations of the so-called primary fibrinous rhinitis and the so-called pseudo-diphtheria bacillus to the diphtheria bacillus of Klebs-Loeffler. *Deutsches Arch. f. klin. Med.*, vol. liv., 14.

211. FORTUNATI. On a rare form of neuro-paralytic keratitis of nasal origin. *Arch. ital. di Otol.*, etc., anno iv., p. 169.

212. BOULAY, M. Epileptiform attacks and hypertrophy of the tonsils. *Arch. intern. de laryng.*, etc., No. 3, 1896.

213. ABERCROMBIE, P. H. Valerianate of zinc in hay-fever. *Brit. Med. Fourn.*, April 19, 1896.

214. BULETTE, WILBUR W. A case of asthma due to nasal obstruction and adenoids of the pharyngeal vault. *New England Med. Monthly*, June, 1896.

215. SCHEPPEGRELL, W. The treatment of hypertrophic rhinitis by the bipolar method of electrolysis. *Ann. Ophth. and Otol.*, April, 1896.

216. MAYER, EMIL. The nasal mucous membrane. A plea for greater care of it in intranasal operations. *N. Y. Med. Fourn.*, June 15, 1896.

217. BELFANTI e DELLA VEDOVA. On the etiology of ozæna and its curability by serum-therapy. *Arch. ital. di Otol.*, 1896, p. 189.

218. GRADENIGO. On serum-therapy in ozæna. *Ibid.*, p. 195.

219. GRADENIGO. On treatment of a form of otitis and ozæna with antidiphtheritic serum. *Ibid.*, p. 336.

220. ARSLAN e CATTERINA. On treatment of ozæna with serum. *Ibid.*, p. 331.

221. DELLA VEDOVA. On the treatment of ozæna with serum. *Ibid.*, p. 334.

222. CHIACONI. Supernumerary dentition in the nose. *Ibid.*, p. 289.

223. FRAENKEL, EUGEN, Hamburg. Contributions to the pathology and etiology of affections of the accessory cavities of the nose (from the new general hospital of Hamburg). *Virchow's Arch.*, vol. cxliii.

224. RÉTHI, L., Vienna. Treatment of suppuration of the nasal accessory cavities. *Wien. med. Presse*, No. 16, 317, 1896.

225. DUNAGIER. On prothesis in the treatment of empyema of the antrum of Highmore. Bordeaux, 1896.

226. LUC. Treatment of chronic empyema of the frontal sinus by a large opening of the anterior wall of the sinus and by drainage into the nose. Method of Ogston and Luc. *Arch. intern. de laryng.*, etc., No. 3, 1896.

227. MERMOD. Meningo-encephalitis following the exploration of a so-called frontal sinus. *Ann. des mal. de l'or.*, No. 4, 1896.

228. GLEITSMANN. Diseases of the accessory sinuses of the nose, with demonstration of specimens, drawings, and instruments. *Annals of Ophth. and Otol.*, April, 1896, and *N. Y. mediz. Monatsschr.*, April, 1896.

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231. COBB, FRED. E. Empyema of the antrum of Highmore. *Bost. Med. and Surg. Journ.*, May 7, 1896.

232. TILLEY, H. Case and specimen of cured polypi of frontal sinus. *Proceedings of the Laryngological Society of London*, May 13, 1896.

233. SOMERS, LEWIS S. Nasal syphilis with extensive lesions. *Med. and Surg. Reporter*, April 25, 1896.

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238. FREYTAG, B., Magdeburg. On fractures of the nose. *Monatsschr. f. Ohrenheilk.*, No. 5, 1896.

239. LERMOYEZ. Two cases of insufficiency of the palatal velum. *Ann. des mal. de l'or.*, etc., No. 4, 1896.
240. COLLIER, MAYO. Some effects of chronic nasal obstruction on the growing skull and upper jaw. *Brit. Med. Journ.*, May 11, 1896.
241. SCHEPPEGRELL, W. Papillomata of the soft palate. *N. Y. Med. Journ.*, April 11, 1896.
242. CAMPBELL, JAMES T. Pharyngomycosis leptothricia. *Med. News*, April 4, 1896.
243. KOPLIK, HENRY. The acute retropharyngeal abscess of infancy and childhood. *N. Y. Med. Journ.*, April 4, 1896.
244. MEYER, WILLY. Incisions of retropharyngeal abscess according to antiseptic principles—from the neck. *Amer. Med. and Surg. Bulletin*, April 4, 1896.
245. MAYER, EMIL. Idiopathic retropharyngeal abscess, with a report of three cases. *N. Y. Eye and Ear Infirmary Reports*, 1896.
246. SEMON, FELIX. Chronic retropharyngeal abscess in an adult. *Proceedings of Laryngological Society of London*, May 13, 1896.
247. EVANS, T. C. Chancre of the tonsil and tongue, with report of four cases. *Med. News*, May 9, 1896.
248. GRIFFIN, E. HARRISON. Chancre found in unusual localities. *N. Y. Med. Journ.*, May 23, 1896.
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251. SCHEPPEGRELL, W. Vertigo of naso-pharyngeal origin. *Med. News*, May 23, 1896.
252. MAKUEN, G. HUDSON. A case of stammering; cure by an operation. *Med. and Surg. Reporter*, May 23, 1896.
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254. HELLER, ADOLF, Nuernberg. The naso-pharynx in pathology. *Deutsch. Arch. f. klin. Med.*, vol. lv., p. 25.
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of the respiratory tract.) From the medical clinic of Professor Riegel at Giessen. *Deutsch. Arch. f. klin. Med.*, vol. lvii., p. 118.

256. RUGE, HANS, Berlin. Tuberculosis of the tonsil from a clinical aspect. *Virchow's Arch.*, vol. cxliv., p. 431.

257. DEICHERT, H., Goettingen. Formation of cartilage and bone in the tonsils. *Virchow's Arch.*, vol. cxli., p. 435.

258. LACOEARRET. Post-diphtheritic pseudo-hypertrophy of the tonsils. *Rev. hebdom. de laryng.*, No. 21, 1896.

259. PIERGILI. A case of severe hemorrhage following tonsillectomy. *Arch. ital. di Otol.*, etc., 1896, p. 283.

260. ARSLAN. Contribution to the study of tumors of the tonsils. *Bollettino delle malattie dell' orecchio*, etc., April, 1896.

208. FERMI and BRETSCHNEIDER made numerous bacteriological investigations and experiments on animals and healthy persons to elucidate the pathogenesis of acute coryza. After a short introduction they discuss the symptoms, the origin, the general causes of coryza, and the various hypotheses, then they report their very elaborate researches as to the occurrence of micro-organisms in the healthy mucous membrane and in catarrhal rhinitis, and as to the communication of coryza to persons and animals. The details have to be read in the original. The authors reach the conclusion, that the acute coryza is no specific infectious disease; other causes, direct influences, external agents in connection with infectious diseases and under concurrence of the nervous system, account for its origin. GRADENIGO.

209. WOODRUFF mentions as concomitant and subsequent symptoms of chronic rhinitis: bronchitis, pavor nocturnus, enuresis nocturna, defective development of the thorax, scoliosis of the spine (!), impairment of hearing, blennorrhœa of the lachrymal sac, disturbed function of the brain, retro-pharyngeal abscesses, cerebro-spinal meningitis. POLLAK.

210. GERBER and PODACK proved the diphtheritic nature of primary fibrinous rhinitis in five cases by the presence of virulent bacilli of Klebs-Loeffler in the fibrinous secretions of the nose. They emphasize the great danger of infection in these cases on account of the relatively slight symptoms and the chronic course, and insist on strict isolation. Because of the scarcity of diphtheria bacilli in the direct dry preparation the diagnosis absolutely requires cultures and inoculations of animals. The authors

found the pseudo-diphtheria bacillus in three of the cases mentioned long after the subsidence of the fibrinous exudations, in two in the purulent nasal secretion, and in one in the discharge of a purulent otitis media which commenced two months after the disappearance of the membranes from the nose. In a case of rhinitis atrophicans they found the pseudo-diphtheria bacillus in the crusts twelve years after diphtheria which had extended into the nose. They doubt a connection between the pseudo-diphtheria bacillus and simultaneous anatomo-pathological changes, but think that a direct relation exists between diphtheria and the later occurrence of pseudo-diphtheria bacilli, surmising that the latter are genuine diphtheria bacilli which have grown avirulent, but may regain their virulence by symbiosis with streptococci or by any other circumstances (*cf.* Yersin, Roux, C. Fraenkel). HAENEL.

211. FORTUNATI describes two cases of severe ulcerous keratitis presenting a certain relation to hypertrophic changes in the nose. GRADENIGO.

212. A boy, aged twelve and a half, constantly suffered every morning for two years from convulsions which were preceded by an aura of formication, fright, and sensation of stiffness in the tongue. The convulsions were combined with loss of consciousness, stiffness of the limbs, and asphyxia. Incontinence of urine; no mark of bites on the tongue. Prompt disappearance after tonsillotomy. ZIMMERMANN.

213. ABERCROMBIE obtained a cure in a patient who suffered from hay-fever by the exhibition of valerianate of zinc, 3 iii in pill, three times a day.

214. BULETTE reports the case of a girl, aged eleven, who had been suffering for two years from difficulty of breathing and attacks of asthma, particularly during the night, together with tinnitus aurium and headache. Anterior and posterior nasal hypertrophies, a large septal ridge on the left side, and enormous masses of adenoid tissue in the naso-pharynx had caused the attacks, which were promptly relieved by operation. M. TOEPLITZ.

215. SCHEPPEGRELL militates against the use of cocain, the electro-cautery, chromic acid, and trichloracetic acid for the treatment of hypertrophic rhinitis, and advocates electrolysis, which, applied submucously, avoids the formation of cicatrices. He employs the galvanic current with the selector or the Edison current with a rheostat, and for either a milliampèremeter. The

bipolar method, by means of the introduction of two platinum needles soldered to copper, is now exclusively used.

M. TOEPLITZ.

216. After an extensive description of the anatomy of the nasal mucous membrane, MAYER militates against the use of the saw, electric burr or plane, and the galvano-cautery, which destroy too much of the mucous membrane. He removes ecchondroses of the septum by dissecting an L-shaped flap of mucous membrane and stitching it back later on, or he uses the electric trephine through the cartilage below the mucous membrane, and removes soft hypertrophies with the cold snare. M. TOEPLITZ.

217. BELFANTI and DELLA VEDOVA examined sixty-three cases of ozæna in regard to the bacillus mucosus of Lœwenberg and Abel, and found a bacillus, to which they attribute some importance in the etiology of ozæna on account of its constant occurrence. It has the properties of the diphtheria bacillus, but differs from it by its absolute inactivity on animals. Mice are immune. In guinea-pigs œdemata and abscesses occur at the place of injection. The ozæna bacillus is mostly analogous to the bacillus of xerosis; it grows well on coagulated serum but not on gelatine. Both authors found that diphtheria antitoxine was antagonistic to the ozæna bacillus in animals, and treated thirty-two patients accordingly with antitoxine. In almost all cases an improvement was attained, in many a condition equivalent to a cure; 5,200 to 27,200 immunizing units were injected.

GRADENIGO.

218. GRADENIGO reports his first investigations which he undertook to verify the results of Belfanti. Fourteen cases were cured, of which 9 were of sufficient duration to count them as results. The maximal doses of immunizing units injected in a patient was 17,450; the minimal, 6000. Gradenigo could not obtain a cure in any case. In 5 cases remarkable improvement immediately after the first injection, but without any progress by continued treatment. In 1 case transient improvement, in 3 cases no alteration at all. Gradenigo believes that a certain amount of cases of ozæna is due to syphilis, others to tuberculosis, and that in others a diathesis cannot be made out. According to this also a bacteriological variety of ozæna may occur.

GRADENIGO.

219. In a later communication GRADENIGO reports that he could prove the constant occurrence of the bacillus of Belfanti,

in 50 cases, 24 were treated ; 2 are in such a condition that they may be considered as cured, 9 very much improved, 5 slightly or not improved, 7 uncertain. In one case of the almost cured, the improvement commenced not before a few days after the treatment ceased, which had lasted 41 days with 28,500 immunizing units. The improvement obtained was not in proportion to the number of immunizing units injected and to the time of treatment. Definite amelioration sets in not before about 15 injections with 1000 units. In chronic purulent otitis and in dry aural catarrh with ozæna, antitoxine brought about considerable improvement. The serum therapy may be indicated also in other forms of purulent otitis, if the bacillus of Belfanti is found.

GRADENIGO.

220. ARSLAN and CATTERINA confirm the constant occurrence of Loewenberg's and Belfanti's bacillus. Four cases of ozæna improved by serum therapy.

GRADENIGO.

221. DELLA VEDOVA obtained a cure in 2 out of 7 cases, and in 2 slight improvement.

GRADENIGO.

222. In a girl with severe ozæna and changes of the alveolar process, a molar tooth and two exostoses, with impressions by other teeth, were extracted. An example of formation of supernumerary teeth.

GRADENIGO.

223. FRAENKEL studied the affections of the accessory nasal cavities in 146 post-mortem examinations, bacteriologically and histologically. He expresses his results in the following words : In a large number of persons with normal accessory nasal sinuses, the latter contain micro-organisms, which play a prominent part in many inflammatory processes of the respiratory tract (*diplococcus lanceolatus* Fraenkel, *staphylococcus pyogenes flavus* and *albus*, etc.). Diseases of the nasal sinuses are surprisingly frequent. In 43 per cent. of his cases, one or several sinuses were diseased ; the antrum of Highmore most frequently (53 times), then the sphenoidal sinuses (25 times), disproportionately rare the frontal sinuses (only 5 times). Inflammation of the sinuses, in most cases, is independent of diseases of the nasal passages. The dental origin of inflammation of the maxillary sinuses is generally overestimated. Probably they are due to general diseases more frequently than heretofore supposed, as acute fibrinous pneumonia, measles, scarlet fever, diphtheria of pharynx, crebro-spinal meningitis, acute peritonitis, and other diseases.

This view of the author is in opposition to that of Zuckerkandl,

who thinks that the inflammations of the sinuses are affections propagated from the nasal passages.

The action of bacteria on the sinuses is not constant, and the presence of a certain micro-organism cannot be inferred from the character of the disease. The occurrence of different micro-organisms may perhaps modify the prognosis of the affections. Diseases of the sinuses would probably be more frequently diagnosed, if systematic rhinoscopy would be practised in all affections of the respiratory tract, and not only if subjective symptoms indicate a nasal trouble. The thickening of the infundibular region is due to irritation from the discharge of the sinuses. Nasal polypi are no evidence of a preceding affection of the sinuses. F. found caries and necrosis of the nasal walls only in tuberculosis and syphilis.

HAENEL.

224. RÉTHI gives a clear synopsis of the empyemata of the sinuses, treated by him, especially in regard to therapeutic results. To that purpose Réthi divides his 78 cases of *empyema of the antrum of Highmore* into two groups: those which he treated from the middle nasal meatus (the hiatus, or an accessory ostium, or an artificial perforation in the lateral wall), and those treated from the lower meatus, or the alveolar process, or the fossa canina. Either treatment yielded about the same results, *i. e.*, 43 per cent. recoveries. Therefore Réthi recommends treatment of the antrum through the hiatus if possible, and if neither caries nor considerable hypertrophy of the mucous membrane exists. The hiatus is permeable for a probe in about 50 per cent. If it is, however, hardly or not at all accessible, or closed, the lateral wall of the middle meatus has to be opened. If empyema is caused by carious teeth, it has to be approached through an alveolus. Although the latter operation gives the patients the advantage to irrigate the antrum themselves, they rather dispense with it, if they know the uncertain chances of this operation, and they would not likely sacrifice a healthy tooth, if a certain cure cannot be promised.

Réthi treated 19 cases of *empyema of the frontal sinus*. After the removal of polypoid growths and of the anterior extremity of the middle turbinated body, the sinus could be probed in 25 per cent. of the cases. Fifty-eight per cent. were cured by irrigations through the natural canal, *i. e.*, in a larger percentage than in empyema of the antrum.

Forty-six per cent. of 35 cases of *empyema of the ethmoidal cells* were cured by removal of polypi, hypertrophies, and portions of the middle turbinated body, or by scraping.

Out of 16 cases of *empyema of the sphenoidal sinuses* Réthi treated 2 through the natural, very wide opening, and 14 after opening very freely the anterior wall, with a cure in 70 per cent. Réthi states that, on the whole, his experience of several years taught him to be more conservative in the treatment of empyema of the nasal sinuses.

POLLAK.

225. DUNAGIER recommends a dental plate of hard rubber, with a pin to be introduced into the canal formed by the drill. After the empyema is healed the pin can simply be cut off.

ZIMMERMANN.

226. LUC observed, that creamy pus is characteristic of empyema of the frontal sinus; pus containing granules, of empyema of the antrum of Highmore.

ZIMMERMANN.

227. MERMOD probed the frontal sinus of a laborer, aged thirty-six, who had suffered for a long time from affections of almost all accessory nasal cavities which had been operated on. In the ensuing operation Mermod found that the frontal sinus was wanting, and that a meningo-encephalitis had set in, as proven by the post-mortem examination. Mermod condemns emphatically the method of Schaefer, and advocates a large opening of the diseased sinus.

ZIMMERMANN.

228. GLEITSMANN demonstrates the anatomy of the accessory sinuses by specimens and drawings, and briefly touches upon their pathology. The symptomatology and diagnosis are fully dwelt upon. He thinks transillumination to be overrated, although of value, and it ought, therefore, never to be omitted. The location of pus is pathognomonic, with a few exceptions, which are enumerated. Probing the orifices is important. The distance of the sphenoid is given as no less than 8 cm in males, and 7 cm in females. For treatment he follows Moritz-Schmidt's plan, first washing the maxillary sinus through the natural opening, then using the trocar through the lower nasal meatus and finally opening through the alveolus of the second molar or through the fossa canina. The ethmoidal cells are treated in this country by ablation of the anterior portions and hypertrophies of the middle turbinal bodies, and by curetting. For treatment of the frontal sinus the external opening is preferable. The sphenoidal sinus is intranasally perforated without much difficulty.

M. TOEPLITZ.

229. In LACK's patient the malar sinus suppuration was cured by a few weeks' syringing. The frontal sinus was opened through

an incision in the line of eyebrow, the field of operation bounded by the supraorbital notch and the pulley of superior oblique ; a large piece of bone removed by the chisel and much pus evacuated. A tube passed through infundibulum into the nose and worn for six weeks when the symptoms disappeared. An inconspicuous scar left in eyebrow. Patient well in two years. CHEATLE.

230. BABER considers that the only certain or pathognomonic sign is the demonstration of pus in the cavity by : (1) probing the natural orifice ; (2) puncture through the alveolus ; (3) puncture through the inferior meatus. He himself advocates the last, using a straight trocar and canula, as recommended by Grünwald ; the point of puncture being at about the junction of the anterior with the middle third and high up, a small aspirating syringe being fitted to the trocar, the point of which is tilted downwards ; if aspiration fails to withdraw pus, he employs Grünwald's plan of attaching a rubber bag to the canula and blowing air through ; the region of the middle turbinal being watched for pus. Baber suggests that aspiration should be effected after some air has been blown into the cavity, the air making an emulsion with the pus and so facilitating aspiration. He has used Grünwald's method in twenty-six cases, and has not failed to enter the antrum in any.

CHEATLE.

231. In the records of the Massachusetts General Hospital of the last 20 years, only about a dozen cases of empyema of the antrum were found, all of a grave type, which were easily diagnosed and operated from without by incision of fluctuating parts. Milder cases had been overlooked. COBB then discussed the diagnosis, which is not always established by transillumination, but positively by exploratory puncture from the lower nasal meatus by means of the electric drill with subsequent washing of the cavity. He does not like to perforate from the fossa canina on account of the reactionary swelling. A valuable guide to diagnosis is a peculiar thin brown mark on the handkerchief. In severe cases, wide opening and drainage are imperative. Latent cases are commonly obstinate. Cobb is in favor of a large alveolar opening. His best results were obtained in acute cases. He concludes with a full report of nine cases.

M. TOEPLITZ.

232. After removing polypi from under the middle turbinal on the left side of the nose, TILLEY found that a probe could be easily passed into the frontal sinus. Both sinuses opened by a median vertical incision, and found to contain granulations ; both

curetted and swabbed out with zinc chloride solution, gr. xl. to $\frac{3}{4}$ i, and drainage tubes inserted and retained for one week, daily irrigation with boracic lotion being practised; opening then allowed to heal, a cure of all trouble resulting. The antrum was explored but found to be healthy.

CHEATLE.

233. A man, aged thirty-two, was suffering, nine years after the contraction of syphilis, from an empyema of the right antrum Highmore, which was opened through the lower lid, right cheek, and right canine tooth, and from which two large sequestra were subsequently removed. Six months after the operation, SOMERS removed from the nasal cavity within two months: the entire right palate bone, the vomer, all the turbinals, various parts of the vertical plate of the ethmoid, and the cartilaginous septum. The tonsils, uvula, and right side of fauces had disappeared, and adhesion of the palatine arch to the posterior wall of pharynx had taken place. Ozæna and suppuration were greatly relieved by large doses of iodide of potassium and mercury.

M. TOEPLITZ.

234. In discussing the subject of foreign bodies in the nose, in young children, SYMONDS describes the symptoms in cases in which the foreign body has been some time resident, as being unilateral, purulent discharge often blood-stained or brown, and with no particularly unpleasant odor, with obstruction, examination revealing swollen mucous membrane and granulations, the foreign body being entirely hidden or appearing black either from its own color or from blood which has dried upon it. He advises examination under an anæsthetic unless the child is particularly good. The diagnosis must be made from unilateral ozæna, tubercular or syphilitic ulceration, and lupus. He relates case of a child, aged eleven, from whose nose he removed a true rhinolith, discharge having been present since the introduction of some rose leaves at the age of three. In discussing treatment he advocates more frequent trial of forcing a stream of water into the healthy side by means of Higginson's syringe. He has only once seen a foreign body in the post-nasal space, a head of a coarse grass, which had been coughed up behind the soft palate. Foreign bodies in the pharynx he divides into two classes: (1) small and penetrating, which usually become embedded in the root of the tongue, tonsil, or pharyngeal wall, or in the fold between the pharynx and tongue; (2) large bodies such as masses of food and tooth-plates. In searching for foreign bodies of the first class

he advises careful examination with a good light before employing digital examination, as a penetrating body may thereby be driven in, dislodged, or pushed farther down. In dislodging a large and impacted body, like a pipe stem, from the neighborhood of the tonsil, the possibility of hemorrhage must be remembered.

CHEATLE.

235. The rhinolith was observed in the right nostril of a girl, aged thirteen, who had suffered for three years from a unilateral discharge, headaches, and mouth-breathing. The left nostril was stenosed by the deflected septum; the right appeared atrophic with a black mass on the floor, which was partly broken by strong forceps, and the remaining portion then easily extracted. The stone weighed $24\frac{1}{2}$ grammes. The nucleus was formed by a blood clot. The paper concludes with a bibliography, a review of the theories of the etiology, the symptomatology, and removal by operation or hydrochloric acid.

M. TOEPLITZ.

236. KNIGHT's case of a pure fibroma occurred in a man, aged twenty-one. It was attached to the posterior end of the left middle turbinated body. The microscopical examination made by Dr. Jonathan Wright revealed a purely fibrous structure, without myxomatous tissue or vessels, and with collection of small round cells, at places near the surface, probably due to inflammation.

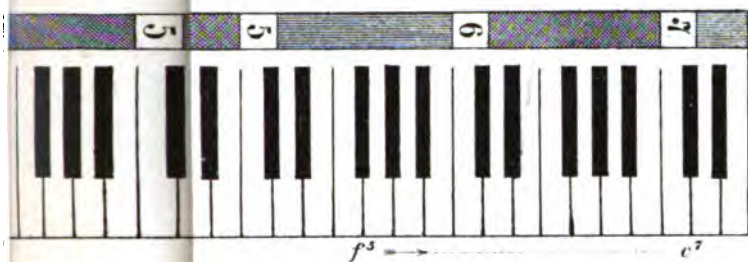
M. TOEPLITZ.

237. In October, 1893, a man aged sixty-two years came to BOND with the history of having had severe attacks of epistaxis since November, 1892. Examination revealed the left side of nose congested, greatly swollen, and plugged in front by a fluctating, slightly movable mass which bled freely on examination with a probe; enlarged glands felt below the left angle of the jaw. Mass snared and curetted and nose plugged. The site of growth (lower part of septum, floor and front of inferior turbinal) afterwards cauterized with the galvano-cautery; glands also removed. Recurrence in March, 1896, mass again removed, but at the time of report again recurred and a gland enlarged in neck.

CHEATLE.

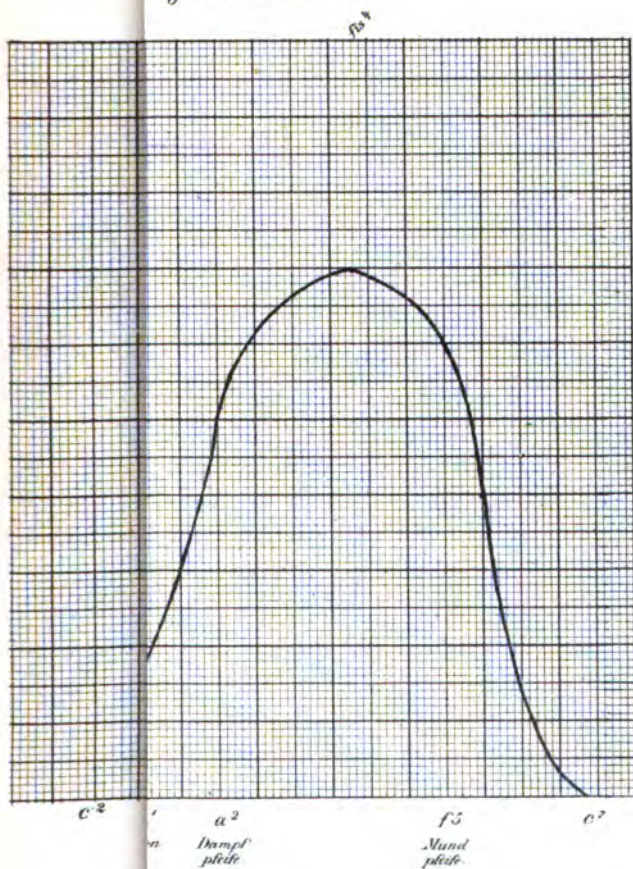
238. FREYTAG reports a case of fracture of the nasal process of the supramaxillary bone and the lower turbinated body with expulsion of the latter. The septum was dislocated and probably the anterior ethmoidal region was also injured. The patient, a boy, aged ten years, had received a blow on the nose from the right by the fist.

KILLIAN.



2.

(30 j. Maschinist.)



239. LERMOYEZ published two cases of arrest of development of the osseous palate in addition to his 11 cases described before. Both cases showed disturbances which were due to the defective closure of the nasal cavity and pharynx. The velum palati was of normal dimensions, but was insufficient on account of its more anterior than normal insertion. ZIMMERMANN.

240. COLLIER thinks that the immediate result of nasal obstruction is a partial vacuum in the nasal chambers, causing, if the obstruction is chronic, collapse of the nasal wall; he attributes high palates and irregular teeth to this condition. CHEATLE.

241. SCHEPPEGRELL's first case accidentally discovered in a young woman, aged twenty-one, presented a tumor, with a pedicle, 15 mm long, attached to the soft palate near the uvula. It was spheroid, 9 mm in diameter, and caused no annoyance.

The second case occurred in a young man, aged eighteen, and was a pedunculated tumor, also attached to the soft palate, hanging down the uvula, although but 3 mm in diameter, caused an irritable cough, which began immediately after going to bed; it was cured by removal of the growth. M. TOEPLITZ.

242. CAMPBELL describes a case of pharyngomycosis lepto-thricia, in a girl aged eighteen, after diphtheria, which disappeared in three or four days, but reappeared at all seasons of the year, particularly during the colder months. Three years later the attacks reappeared after scarlet fever, at intervals of two months until nine months later, when the white spots remained permanent. They extended over both tonsils and a small portion of the posterior pharyngeal wall, and projected from the lacunæ. A month later they were also observed upon the base of the tongue. They were excised for microscopical examination, of which an excellent description is given by Dr. Lewellyn F. Barker of the Johns Hopkins Hospital. Treatment with chromic acid.

M. TOEPLITZ.

243. KOPLIK bases his experience upon 77 cases, which he divides into sets as follows: 1. Acute, pointing, (a) wholly internally, (b) internally and externally, (c) chiefly externally. 2. Chronic tuberculous. 3. Septic retropharyngeal abscess; the latter are burrowing abscesses due to infection after or with the exanthemata. An idiopathic abscess is an impossibility, since there is an intimate relation between the tonsils, gums, and soft palate and the lymphatic system behind the pharynx. Streptococci are always present in the depths of tonsillar lacunæ.

Stomatitides, angina, and influenza are the causative factors of retropharyngeal abscess, the pus of which contains four non-virulent species of streptococci. The acute abscess is pre-eminently a disease of infancy and most frequently between the sixth and twelfth months during the period of suckling. The abscess may open spontaneously, leading to recovery; complications, such as asphyxia, pneumonia, reflex syncope, hemorrhage from large blood-vessels, connection with inner ear, have been observed. Koplik holds the prognosis of uncomplicated cases to be good when treated by timely operation. In most cases internal incisions are sufficient, particularly in set 1. In the second set, in which deep cervical glands at the side of the neck are involved with the primary abscess behind the pharynx, and in tuberculous abscesses, Koplik advocates the operation from without.

M. TOEPLITZ.

244. MEYER reports the results attained in four cases of retropharyngeal abscess by the opening from without. He prefers Burkhardt's method, which consists in cutting at a level with the larynx on the inner side of the sterno-cleido-mastoid muscle and ligating the encountered subcutaneous veins. The exposed carotid is held aside and the incision made in the depth, just at the side of the larynx. The operation is to be performed in Rose's posture (the head hanging down), in septic and tuberculous cases of adults as well as in infants.

M. TOEPLITZ.

245. MAYER discusses the rarity of retropharyngeal abscess, its prevalent occurrence in early childhood, its occasional appearance also in adult life even in the acute form, its symptomatology and treatment. He prefers the internal incision on account of saving of time, the danger of chloroform, the absence of aseptic conditions in the surroundings of the patient, the immediate success, the long delay of ultimate recovery after external operation, which leaves a permanent external scar.

He reports three cases, which he had observed in children, aged one year, six months, and six weeks respectively, the first of which had been incised and recovered, the second had died of exhaustion before an attempt at operation was made, and in the third absorption had taken place without operation. An extensive bibliography is appended.

M. TOEPLITZ.

246. In SEMON's case an abscess formed in the posterior pharyngeal wall without any definite cause. The patient aged thirty-seven had an indistinct history of syphilis. Although the

pus had been evacuated no improvement had taken place. Iodide of potassium was being exhibited ; if a cure did not result Semon proposed to thoroughly open and scrape. The case was shown, because such a condition without any known traumatic or diathetic cause is rare. CHEATLE.

247. The diagnosis of primary syphilis of the mouth and tonsils can be arrived at by exclusion, since all ulcerative lesions of these parts are either malignant, tubercular, or syphilitic. In carcinoma of the tonsil, the pain and enlargement of the tonsil precede the ulceration for several months. Primary ulcerations are best distinguished from those of secondary and tertiary stages of syphilis by the unilateral involvement of the cervical and sub-maxillary glands. These facts are illustrated by four cases. The tonsil is next to the lips the most frequent seat of extra-genital chancre. Secondary eruptions, mostly papular, appear rather early after tonsillar chancre, which is often innocently acquired.

M. TOEPLITZ.

248. GRIFFIN reports twenty additional cases of extragenital chancre, which generally originates in a mucous patch, but is often directly inoculated from a primary sore. The bubo on the corresponding side of the neck was present in all cases but one. The chancre gives little pain. Chancre of the mouth occurs earlier than others, often even during the first and second weeks. In strumous persons the glands are larger than in infected healthy ones. The eruption develops early, even as early as six days after primary chancre, the severity being the same according to the constitution. Many cases come from kissing. There were eight chancres of the lip, four of the tongue (among which was one of the base of the tongue without bubo), two of the tonsil due to sexual perversion, one ulcer of the nose, one of the gum inoculated by a tooth-brush, one of the nipple from nursing, one of the anus of a child, twenty-six months old produced by wiping with a cloth used by his syphilitic grandfather, one of the lower portion of the hand from a bite, and one of the anus of a boy, aged ten, from pæderasty. Griffin militates against the practice of kissing. Syphilis is not always a venereal disease and should be reported. Prostitution should be governed by law.

M. TOEPLITZ.

249. WRIGHT draws attention to dermoid cysts of the tip of the nose. He also relates two cases in which ulceration was present in front of the pinna in connection with a so-called

auricular fistula ; he thought the ulceration was tuberculous but no bacilli could be found.

M. TOEPLITZ.

250. A patient of WOODS's had had the cartilaginous nose destroyed by lupus. A Dieffenbach's flap was cut from the forehead. The remaining skin from the nose detached and reflected downwards, so that the raw surface looked forwards and the skin backwards towards the nasal cavity ; the raw surface of this triangle then adapted to the forehead flap, so forming a portion of the skin lining the new nose. The lining completed by the flaps inverted to form the alæ. The whole new nose thus lined with skin obviating tendency to contraction. Forehead surface covered by flap of skin transplanted from the arm according to Wolfe's method.

CHEATLE.

251. SHEPPEGRELL's patient, aged twenty-four, while making an attempt to clear his naso-pharynx, became dizzy. During several such attacks of vertigo he even lost consciousness for two to three minutes. There was also great pain over the right eye. The right nostril revealed an ecchondrosis of the septum and hypertrophy of mucous membrane, causing marked stenosis. The naso-pharynx exhibited chronic inflammation and was covered with thick secretion. The pain in the supra-orbital region of the eye was due to occlusion of the orifice of the right frontal sinus. The removal of the thickened cartilage and mucous membrane cured all conditions.

M. TOEPLITZ.

252. MAKUEN diagnosed the case of stammering in a boy as one of chorea of the facial, lingual, pharyngeal, and laryngeal nerves due chiefly to adenoids and partly to some deviation from the normal in the genio-hyo-glossus muscle and to defective vision. He removed the adenoids, divided the frenum lingue well back, removed the elongated uvula, made the tongue protrude better by daily tractions, corrected the refractive error with glasses and ocular exercises prescribed by Dr. De Schweinitz, and augmented the entire effect of the successful operation by elocutionary drill.

M. TOEPLITZ.

253. Out of sixty cases of total synechia of the velum palati, collected from literature by KOLLBRUNNER, twenty-eight showed distinct marks of syphilis ; the others were uncertain or had no syphilis. The influences of oral breathing on the general system, the respiratory tract, the development of the face and upper jaw, the teeth, and the voice are discussed in detail. Finally the clinical histories of two cases are given, which had been operated

on by Kuhn. For after treatment a tube in connection with a palatal plate for introduction into the naso-pharynx is recommended.

HARTMANN.

254. HELLER states his opinion on the genesis of infectious diseases, already published in the *Muenchener med. Woch.*, 1894, that all infectious diseases are caused by inhalation. The first localization of the germs takes place in the nose and naso-pharynx (period of incubation and initial stage) with symptoms of local irritation, from which the absorption, *i. e.* the general infection, starts. In this view Heller employed a special method of treatment of infectious diseases for the last twenty-five years, which consists chiefly in the thorough cleansing of the naso-pharynx. The author also calls attention to the great importance of the nose and pharynx in regard to the pathogenesis and therapeutics of many other diseases, particularly for the local affections of the upper air passages, eczema of the face, various forms of neuralgia of the face (or frontal or occipital), of struma, probably also for the exophthalmic goitre and many cases of chlorosis.

HAENEL.

255. STICKER found on patients of the medical polyclinic at Giessen a frequent association of chronic dry pleurisy with chronic pharyngitis. In regard to etiology and clinical status these cases could be divided into two groups :

Group 1. Scrofulous or tuberculous individuals or those predisposed to tuberculosis. They showed chronic hyperæmia of the mucous membrane with granulations and hypertrophy of the lateral columns or diffuse hypertrophy of the entire pharyngeal mucous membrane with or without partial cicatricial atrophy.

Group 2 embraces persons with marked symptoms of acquired or hereditary syphilis, or in whom there is a strong suspicion of syphilis. The pharynx is simply dry or there is a diffuse atrophy of the lining of the pharynx. Detailed clinical histories are given for both groups. Then Sticker describes elaborately the idiopathic diffuse atrophy of the pharyngeal mucous membrane, "xerosis faucium," which is characterized by insufficient development and gradual disappearance of the whole lymphatic apparatus of the pharynx in contradistinction to the pharyngeal diseases of tuberculous persons. The atrophy supervenes simultaneously in the mucous, submucous, and muscular coats, and frequently spreads from its favorite place, the naso-pharynx, to the adjoining mucous membranes of the respiratory track, the nose and the

lungs. It is not the result of relapsing inflammatory swellings, as is often maintained, but primary and inflammatory processes develop from it as accidental complications; thus ozæna proper may complicate xerosis. Xerosis faucium creates a strong suspicion of syphilis, hereditary or acquired. Occupations and habits of life may bring about this transient curable dryness of throat in non-syphilitic persons, but in syphilitics they may be the incidental causes of incurable xerosis. HAENEL.

256. RUGE reports a case of primary tuberculosis of the right tonsil with secondary suboccipital Pott's disease, observed in the clinic of Gerhardt, and from a former record adds another case of Pott's disease with simultaneous swelling of tonsils, possibly also due to primary tuberculosis of the tonsils. Ruge examined the tonsils of 18 patients, selected at random, in order to get an idea of the frequency of tonsillar tuberculosis, and found tonsillar tuberculosis histologically in 5 cases besides the one described above. In no case the tuberculosis could be recognized microscopically; it presented the aspect of a simple catarrhal angina or tonsillar hypertrophy. In 2 cases the small and flat tonsil did not show anything striking. In all 5 cases there was simultaneous pulmonary phthisis; in 4 the infection of the tonsil came secondarily from the sputum, in 1 the tuberculosis of the tonsil was primary. Ruge thinks that primary tuberculosis of the tonsils is not rare in scrofulous children. This seems to be probable from the inoculations made by Dieulafois and the researches of Orth, who frequently found tubercles in diphtheritic tonsils of children, who were not affected with tuberculosis of the lungs. Primary infection of the tonsils may be derived from the food or the inhaled air; the secondary, from tuberculous sputum (most frequently), or through the blood or lymph.

HAENEL.

257. DEICHERT adds three cases of formation of bone or cartilage within the tonsils to the two of Orth. The bone or cartilage was situated at the periphery of the lymphatic substance, imbedded in tough connective tissue and growing towards the lacunæ. Deichert considers, with Orth, these formations as congenital portions of the second branchial arch, just like the pieces of cartilage and bone in the styloid ligament. In one of his cases both these formations were combined. These foci of cartilage and bone may be of practical importance, if they should give rise to formation of tumors by inflammatory irritation. HAENEL.

258. LACARRET thinks that the hypertrophy was due to an infectious lymphadenic process, caused by the diphtheritic poison, not to inflammation. But how they should be discriminated is not mentioned. The tonsils, which at first touched each other in the median line, were reduced to normal size after 1½ months' medical treatment.

ZIMMERMANN.

259. Both tonsils of a patient, aged twenty, were partially removed with the tonsillotome. Profuse hemorrhages from right tonsil after seven hours and again after nine hours, which were stopped with difficulty. After five days two more hemorrhages, which recurred on the eighth and thirteenth day after the operation. The right common carotid was ligated. On the two following days temperature of 40° C., convulsions of the limbs on the right side with paresis and deliria. These symptoms ceased on the seventh day.

GRADENIGO.

260. ARSLAN collected 110 cases of tumors of the tonsils from literature. Next to syphilitic cases sarcoma is the most frequent. Arslan reports his observation of angiosarcoma of the right and carcinoma of the left tonsil.

GRADENIGO.

BOOK REVIEWS.

I.—Dr. R. DREYFUSS (Strassburg) : **Die Krankheiten des Gehirns und seiner Adnexa im Gefolge von Naseneiterungen.** (The Diseases of the Brain and its Adnexa that Result from Nasal Suppurations.) Jena, Gustav Fischer, 1896.

Reviewed by Dr. O. Koerner of Rostock.

Dreyfuss has searched literature very thoroughly and has collected the cases of diseases of the brain due to suppuration in the nose or its neighboring cavities. It is to be hoped that this comprehensive book will draw attention to a neglected field. What we need to begin with are reports of cases which show accurate observation. The author deserves credit for his care in arriving at conclusions from such limited material. The lesson which this book teaches is of the greatest importance to rhinologists.

II.—Dr. L. YANKAU : **Vademecum und Taschenkalender für Ohren-, Nasen-, Rachen- und Halsärzte auf die Zeit April 1896 bis März 1897.** (Vademecum and Pocket Calendar for Ear, Nose, and Throat Specialists, from April, 1896, to March, 1897.) Leipzig, Eduard Heinrich Meyer.

Reviewed by Dr. Arthur Hartmann of Berlin.

It is difficult to estimate how much necessity there is for a pocket-calendar for ear, nose, and throat specialists; its success will be the only means of deciding. The practice of these specialties is carried on in offices and not at the homes of patients, and for this reason the necessity for such a note-book seems doubtful. Nevertheless, it may prove useful to have in convenient form, briefly arranged data of the latest experiences and measures, and especially the dosage of therapeutic remedies.

In the calendar before us the author has not limited himself to the field expressed by the title, but has included the connection

between these specialties and general medicine, believing that even the specialist must be prepared to render rapid assistance in certain emergencies. Hence the chapters include first aid to the injured, poisoning and its treatment, and the maximum doses of therapeutic remedies. The contents which appeal to the specialist are the following: Anatomical, physiological, pharmacological, and toxicological data, disinfection of the hands, the present status of serum-therapy, and the most recent additions to medicinal agents used in the treatment of diseases of the ear, nose, and throat. A chapter is devoted to the cure of deaf-mutism by methodical acoustic exercises. The most general and the most incomplete chapter is the one which treats of ear, nose, and throat symptoms and their diagnostic importance in diseases of the nervous system. That portion of this chapter which refers to the ear reads as follows: "We distinguish diminution in hearing (Hypacusis), increase (Hyperacusis), and loss (Anacusis). These occur not only in diseases of the middle and internal ears, but also in hysterical hemianæsthesia, and the examination is to be extended in these directions."

The calendar is not likely to be used extensively unless subjected to a thorough revision. The first edition presents many defects and errors to which the author himself calls attention in the preface; a new edition is, therefore, quite essential; when improved in this respect, we do not doubt that it will find its way into use.

The list of the various ear, nose, and throat specialists practising in Germany is useful but quite incomplete; it ought to be made to correspond to the English medical directory in which the course of study and important works of each specialist are given. In addition, the names of physicians residing in watering-places and sanitary resorts, who are identified with these specialties, would be most desirable.

III.—Dr. HUGO HESSLER (Halle): **Die otogene Pyæmie.** (Otogenic Pyæmia.) With 7 figures and 26 tables. Jena, Gustav Fischer, 1896.

Reviewed by Dr. A. Scheibe, of Munich.

The thoroughness with which this subject has been discussed by numerous authorities within the past few years precludes any great exhibition of progress in a new monograph; nevertheless, Hessler's treatise adds materially to our knowledge in this field, in certain directions, and gives evidence of great industry and depth.

It is not only the most extensive work, but also the richest in material, of any which treat of pyæmia ; it includes an account of anatomical relations involved and the study of pyæmia in general.

Pathological anatomy has been gone into very deeply, the author having very properly realized the possibility of presenting a more complete picture in this chapter than in that treating of symptomatology, which is handicapped by lack of precision in published histories of cases. On this account it seems doubtful whether it was wise to regard every case as of equal importance, and whether, with material varying so much in value, it would not have been better to weigh it more carefully before utilizing it.

Too little stress has been laid upon the fact that sinus thrombosis can run its course without symptoms. In a work so carefully written in other respects, a defect of this sort becomes more pronounced because it tends to increase the uncertainty already existing in this matter. Thus, Hessler considers those instances of pyæmia which recover without operation to be identical with the cases of osteophlebitis, in contradistinction to sinus phlebitis ; there is certainly no justification for this view, since both spontaneous recovery from sinus phlebitis and a course without symptoms are known to occur, and probably do occur more frequently than autopsies lead us to believe. On this account, it is not yet possible, with our present knowledge, to establish a differential diagnosis between pyæmia with sinus phlebitis and pyæmia unaccompanied by it. It is possible merely to differentiate between the light and the severe forms of otogenic pyæmia—which distinction Hessler unconsciously makes,—although we must remember that the fatal cases are almost exclusively examples of sinus phlebitis. There would seem to be more justification for differentiating between cases of pyæmia complicating acute suppurations of the middle ear and those occurring with chronic aural suppurations ; here there exist rather marked differences, as Hessler's work also shows. However, it would be necessary to be very critical in distinguishing between these two groups ; cases of acute suppuration with purulent degeneration of the thrombus would be likely to give rise to doubt.

In the chapter on the prophylactic treatment of pyæmia, *i. e.*, the treatment of acute and chronic suppurations of the middle ear, Hessler departs from his resolution to utilize previous experiences in as objective a manner as possible, and devotes a

relatively large amount of space to theoretical conclusions—a departure of very doubtful value.

On account of the detailed descriptions of cases scattered throughout the entire book, the monograph is adapted more as a work of reference than for casual reading. In the preparation for a second edition, it might be well to omit the partial repetition of fatal cases added to the various chapters; an increased circulation would certainly follow such a change.

IV.—THOS. BARR (Glasgow): **Manual of Diseases of the Ear**, including those of the Nose and Throat in relation to the Ear. Second edition. Jas. Maclehose & Sons, Glasgow, 1896 (The Macmillan Co., 66 Fifth Ave., New York. Price \$3.50).

Dr. Barr's text-book appears in a new garb, large-octavo, instead of small-octavo, as in the first edition in 1884. Paper, presswork, and illustrations (these have doubled) are of the best, and the style is easy, clear, and concise. It is a manual *comme il faut* for the student and practitioner, avoiding all uncertainties and speculations, but presenting the rich contents of modern otology in a lively, attractive, and impressive manner, testifying that its author is not only fully conversant with his subject, but that he has been one of the promoters of the recent marvellous progress in the science and art of this department of medicine. His work, in conjunction with WM. MACEWEN, in the mastoid and intracranial complications of middle-ear disease is unexcelled. The 386 pages of text, with 229 handsome illustrations, a formulary, a very detailed index, and a bibliography, contain all the student wants to learn, the aural practitioner need know, and the teacher and specialist like to read, in order to refresh their memory and familiarize themselves with the discoveries and inventions of recent years fittingly inserted into the proper places of our old acquired stock of knowledge.

H. K.

MISCELLANEOUS NOTES.

APPOINTMENTS.

McKEOWAN, W. A., M.D. Ireland, M. Ch., has been appointed Lecturer on Ophthalmology and Otology, Queen's College, Ireland.

Prof. A. BARTH, formerly in Marburg, at present in Breslau, has accepted the offer of the Professorship of Otology at the University of Leipzig.

Dr. T. C. EVANS has been appointed Professor of Ophthalmology, Otology, and Laryngology at the Kentucky School of Medicine of Louisville.

THE BRITISH LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL ASSOCIATION.—The following have been elected office-bearers for the ensuing year : President : Dr. W. Milligan (Manchester) ; Vice-Presidents : Dr. J. Middlemass Hunt (Liverpool), Mr. F. Marsh (Birmingham), Mr. E. C. Hilkin (London).

The late Mr. GEORGE STACKEY LEAN, J.P. for Somerset, of Lyde House, Bath, has left £100 to the Bath Ear and Eye Infirmary.

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1. FR. BEZOLD. The Present Status of our Auditory Tests. Translated in the July number of this volume.
2. F. SIEBENMANN. The Central Auditory Tract and its Sufferance from Tumors of the Mid-Brain. Illustrated.
3. O. KOERNER. Case of Chloroma of both Temporals, both Sigmoid Sinuses, and both Orbits.
4. J. DUNN. *Aspergillus Glaucus* in the Human Nose. Translated from the English Edition.
5. O. BRIEGER. Otitic Pyæmia. Translation in this number.
- 6 and 7. Reports of Societies, and Reviews. All translated.

Vol. XXIX., No. 3. Issued September, 1896.

8. J. MORF. Otitic Abscesses Occipital Lobe.
9. AD. LEVY. Report on the Otological Clinic in Copenhagen.
10. O. KÖRNER. Note on the Symptoms of Phlebitis of the Cavernous Sinus.
11. J. HEGETSCHWEILER. Bezold's Mastoiditis with Pyæmia.
12. R. ABBE. Carotid-Hemorrhage from Middle-Ear Necrosis. Translated from the English Edition.
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- Report on the Progress of Otology in the Second Quarter of 1896. Translated in this number.
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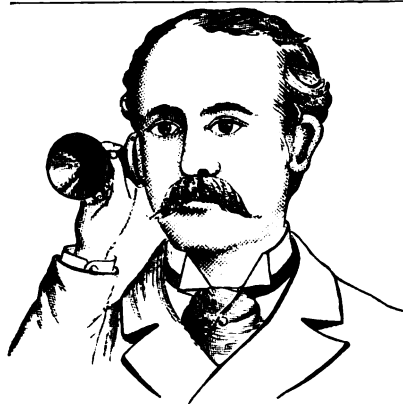
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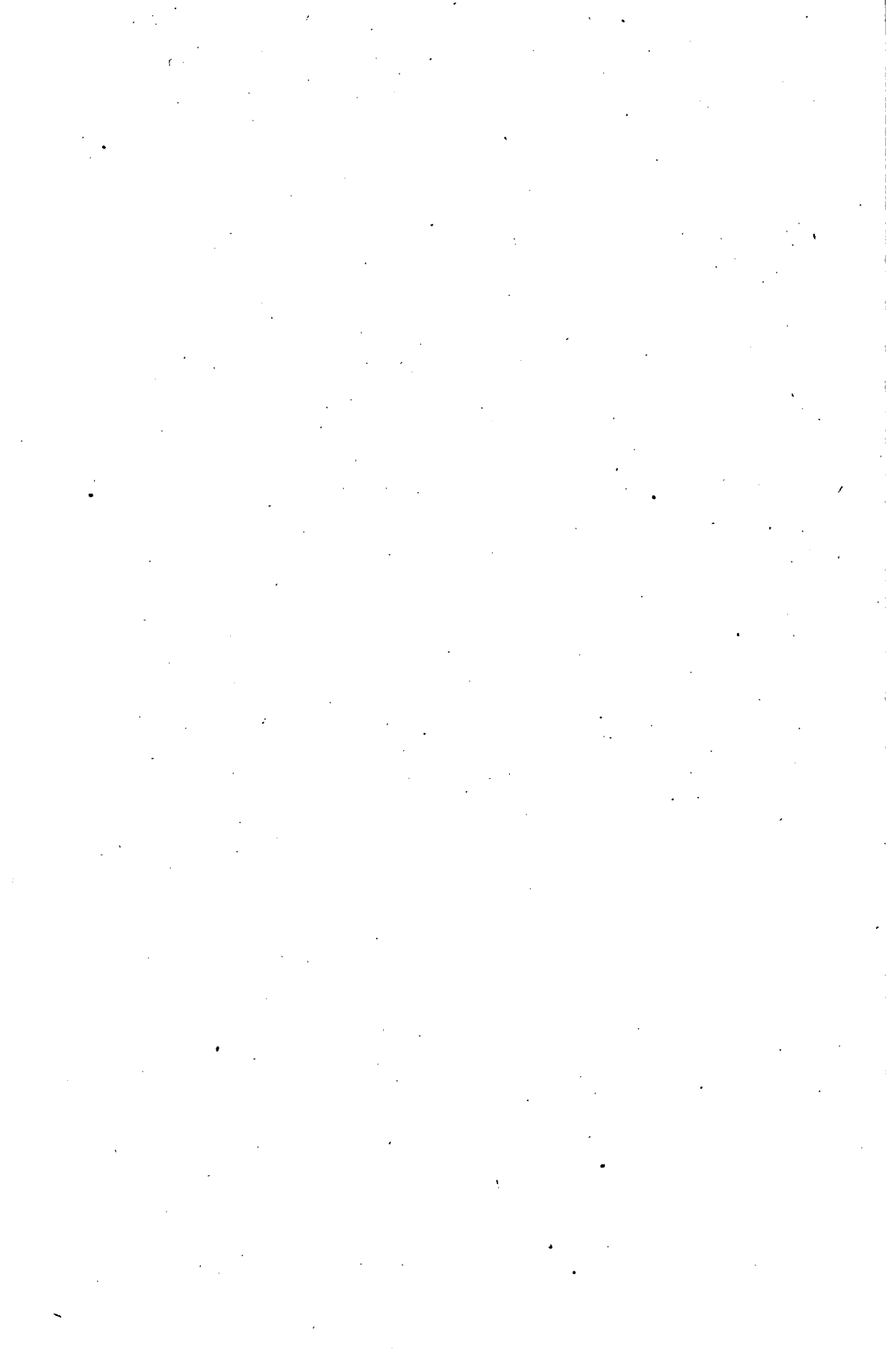
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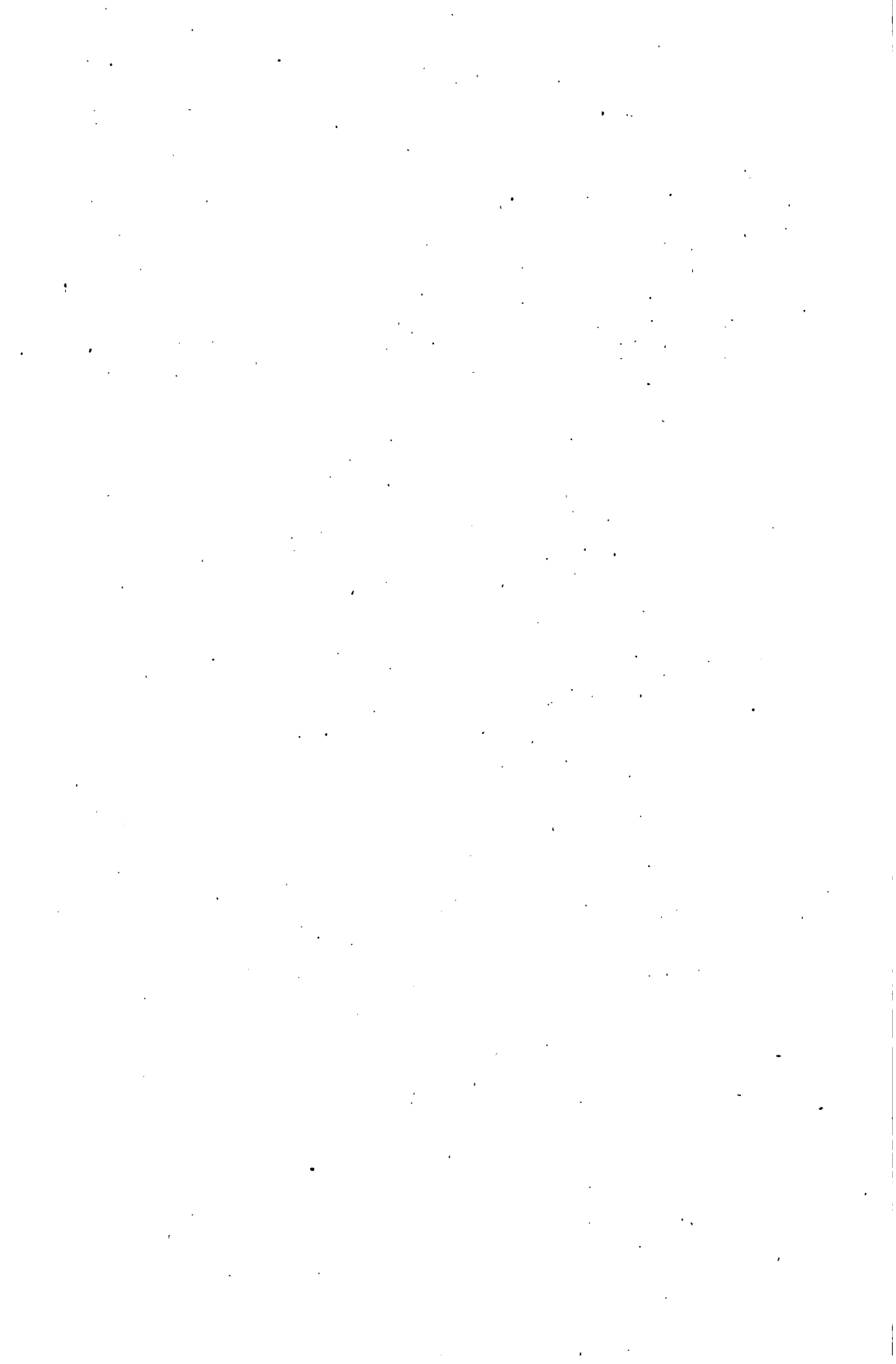
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